

# Rio Algom Mining LLC

May 26, 2020

Mr. Thomas Lancaster  
United States Nuclear Regulatory Commission  
Mail Stop T5-A10  
Washington, DC 20555-0001

Subject: SUA-1473, Docket No. 40-8905, Reporting of Monthly Sampling Results for First Quarter 2020, Rio Algom Mining LLC, Ambrosia Lake West Facility

Dear Mr. Lancaster:

This letter represents reporting of the first quarter (January through March) 2020 analytical results from monthly sampling for the following constituents and wells (**Figure 1**) in accordance with Condition 34.F of SUA-1473 (the License):

- Gross alpha, beryllium, and cadmium in Dakota Sandstone well 36-06 KD.
- Molybdenum and gross alpha in Dakota Sandstone well 32-45 KD-R.
- Gross alpha in Tres Hermanos B well 31-02 TRB-R.

The path forward for constituents exceeding their respective Groundwater Protection Standards (GPSs) has been described in detail in the following documents:

- Corrective Action Plan (CAP) submitted within the *Semi-Annual Groundwater Stability Monitoring Report for the 1<sup>st</sup> Half of 2016* on July 29, 2016, ML16215A059.
- Rio Algom Mining LLC (RAML)'s letter to the United States Nuclear Regulatory Commission (NRC), *Re: Status Update and Additional Alternate Concentration Limit Rationale*, dated April 13, 2017, ML17108A332.
- The *Data Collection Work Plan in Support of Additional Alternate Concentration Limits*, submitted November 27, 2017, ML17340A826.
- *Responses to NRC Comments Ambrosia Lake Work Plans 2017 and 2018*, submitted May 4, 2018, ML18192C139.

RAML submitted the *Editorial and Administrative Amendment to SUA-1473* (ML20054B747) and supplemented this document with a letter dated March 14, 2020 (ML20093B937), which included a request and justification to remove the gross alpha GPS from the License. The request is currently under technical review by NRC. Monitoring for gross alpha will be discontinued if the amendment is approved and the gross alpha requirement is removed from the License.

NMSSOI

NMSS

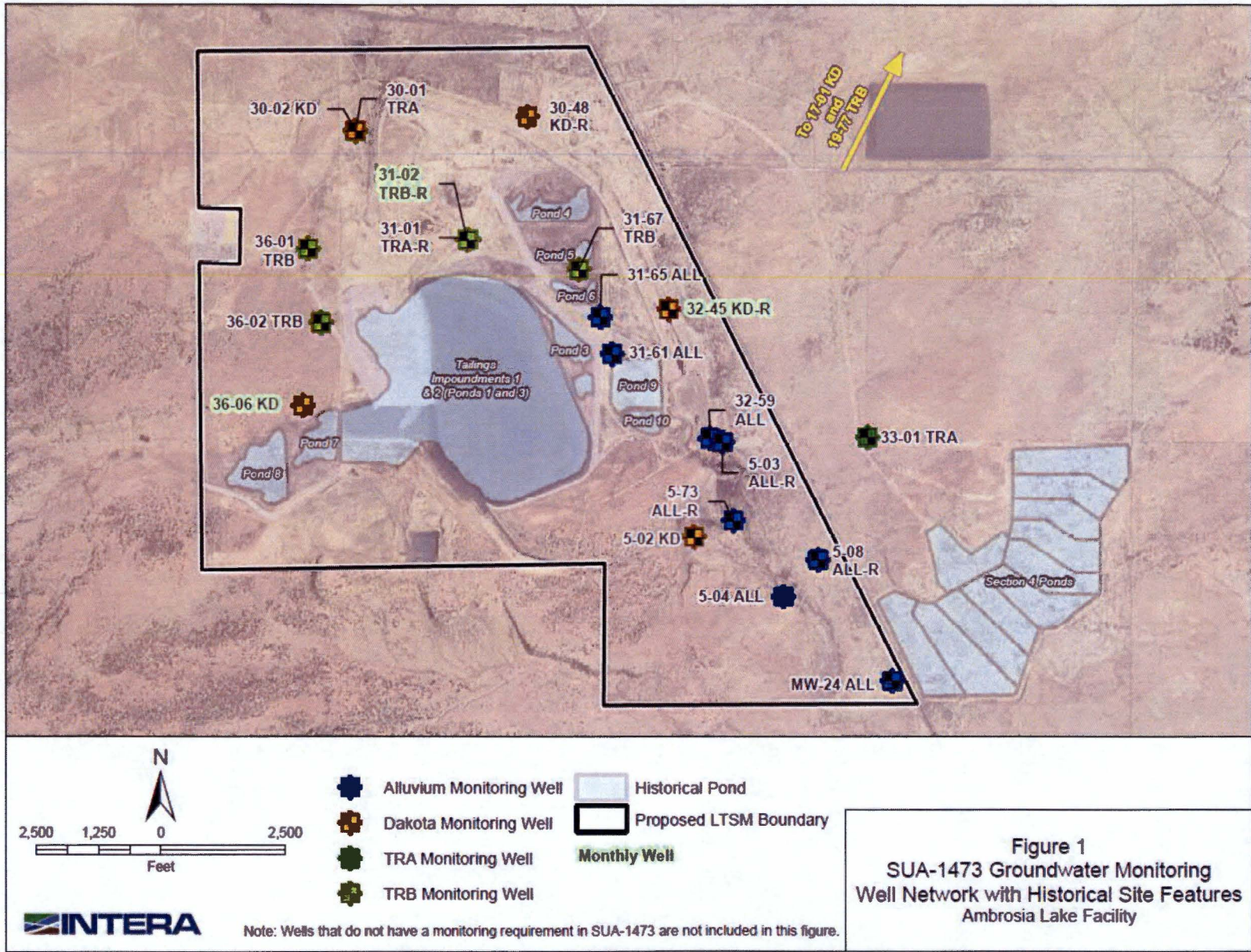


Figure 1. SUA-1473 Groundwater Monitoring Well Network with Historical Site Features.

The tables included in this report summarize the sampling results from the first quarter of 2020. Bolded results indicate exceedances of GPSs. Laboratory analytical reports<sup>1</sup> for the groundwater samples collected during the first quarter of 2020 are provided as **Attachment 1**. Note that uranium concentrations are measured monthly in all three wells for calculation of the gross alpha activity, but do not exceed alternate concentration limits (ACLs) and are not reported here.

**Dakota Sandstone Well 36-06 KD**

Monthly sampling results from well 36-06 KD during the first quarter of 2020 show that cadmium and beryllium concentrations were below the GPSs (**Table 1**). An outlier result from the January monthly monitoring exceeded the cadmium GPS, but re-analysis of the January sample indicated that the initial result was an analytical error. The laboratory report has been revised to include the result of the re-analysis, which has superseded the originally reported outlier. Both beryllium and cadmium concentrations show overall decreasing trends since 2007, and concentrations have been at or below the GPSs for more than two years (**Figure 2** and **Figure 3**).

**Table 1. Beryllium, Cadmium, and Gross Alpha in 36-06 KD.**

Date	Well 36-06 KD		
	Beryllium (mg/L)	Cadmium (mg/L)	Gross Alpha (pCi/L)
<b>GPS</b>	<b>0.01</b>	<b>0.01</b>	<b>56</b>
1/7/2020	0.00712	0.00479	40
2/25/2020	0.0067	0.0052	54
3/18/2020	NM	0.0057	<b>100</b>

**Notes:**

Exceedances are bolded.  
 mg/L = milligrams per liter  
 pCi/L = picoCuries per liter  
 NM = Not measured<sup>1</sup>

<sup>1</sup> Laboratory reports in Attachment 1 include samples and analyses that are not discussed in this letter, but will be evaluated in the 2020 first half semi-annual groundwater monitoring report, which will be submitted by August 1, 2020.

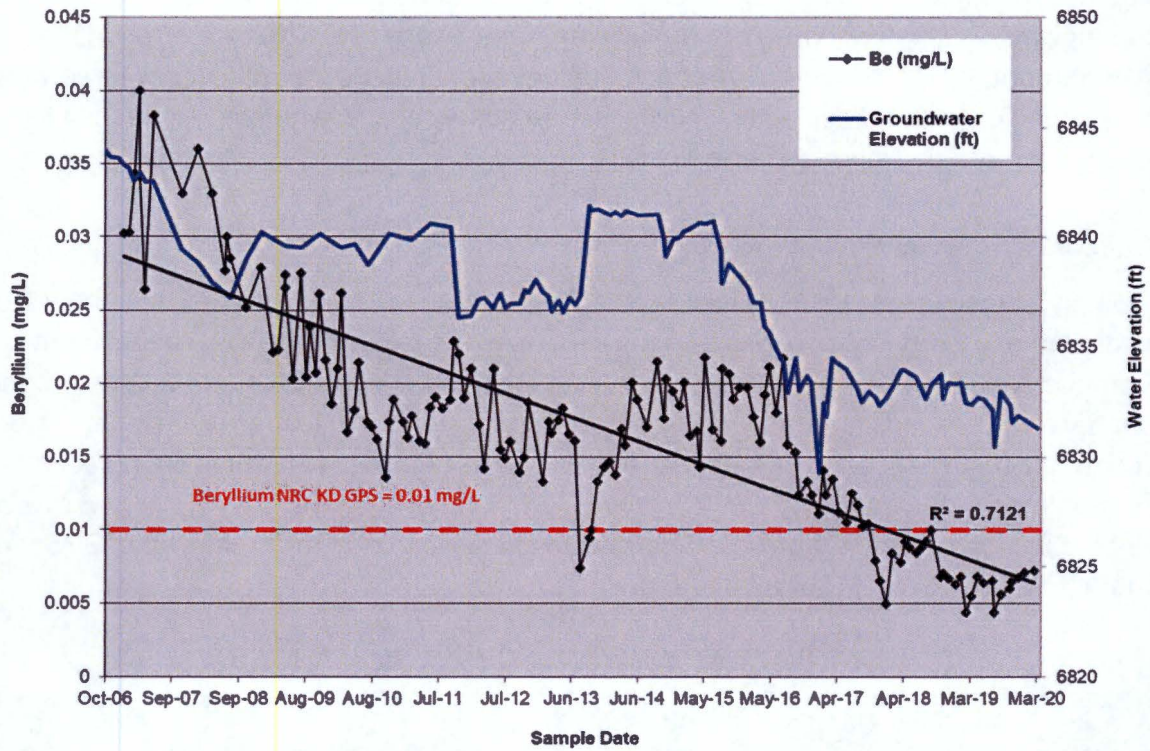


Figure 2. Beryllium Concentrations in Dakota Sandstone Monitoring Well 36-06 KD.

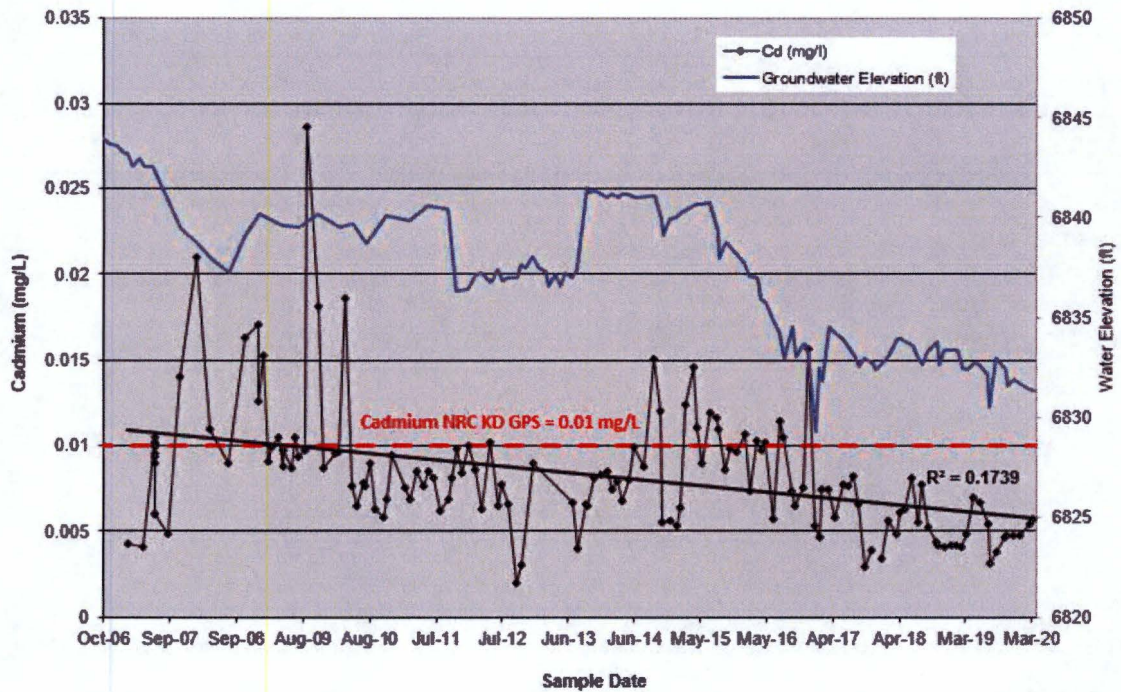


Figure 3. Cadmium Concentrations in Dakota Sandstone Monitoring Well 36-06 KD.

RAML stated in the *Groundwater Stability Monitoring Report, Second Half of 2019* (ML20045D953) that it would discontinue monthly monitoring of beryllium and cadmium at well 36-06 KD in the first quarter of 2020. The last monthly sample for beryllium was collected in January 2020, and the last monthly sample for cadmium was collected in March 2020.

Gross alpha activity exceeded the GPS of 56 picocuries per liter (pCi/L) in March of the first quarter of 2020 (**Table 1**). RAML will continue monthly monitoring for gross alpha at well 36-06 KD in accordance with monitoring requirements in SUA-1473.

**Dakota Sandstone Well 32-45 KD-R**

Results for molybdenum and gross alpha in first quarter 2020 samples from well 32-45 KD-R are displayed in **Table 2**. Concentrations of molybdenum in well 32-45 KD-R continue to exceed the GPS of 0.06 mg/L (**Figure 4**). Pursuant to Condition 34.F and Criterion 5D of 10 CFR Part 40, RAML proposed a CAP to address the exceedances of molybdenum in well 32-45 KD-R, as presented in the *Groundwater Stability Monitoring Report, First Half 2014* (ML14217A463). Gross alpha activity measured in well 32-45 KD-R exceeded the GPS of 56 pCi/L during the three monitoring events of the first quarter of 2020; however, concentrations of major alpha-emitting constituents remain below their respective ACLs. RAML will continue monthly monitoring for both constituents in well 32-45 KD-R in accordance with monitoring requirements in SUA-1473.

**Table 2. Molybdenum and Gross Alpha in 32-45 KD-R.**

Date	Well 32-45 KD-R	
	Molybdenum (mg/L)	Gross Alpha (pCi/L)
<b>GPS</b>	<b>0.06</b>	<b>56</b>
1/13/20	<b>0.152</b>	<b>90</b>
2/27/20	<b>0.174</b>	<b>87</b>
3/18/20	<b>0.115</b>	<b>92</b>

**Notes:**

Exceedances are bolded.  
 mg/L= milligrams per liter.  
 pCi/L=picoCuries per liter.

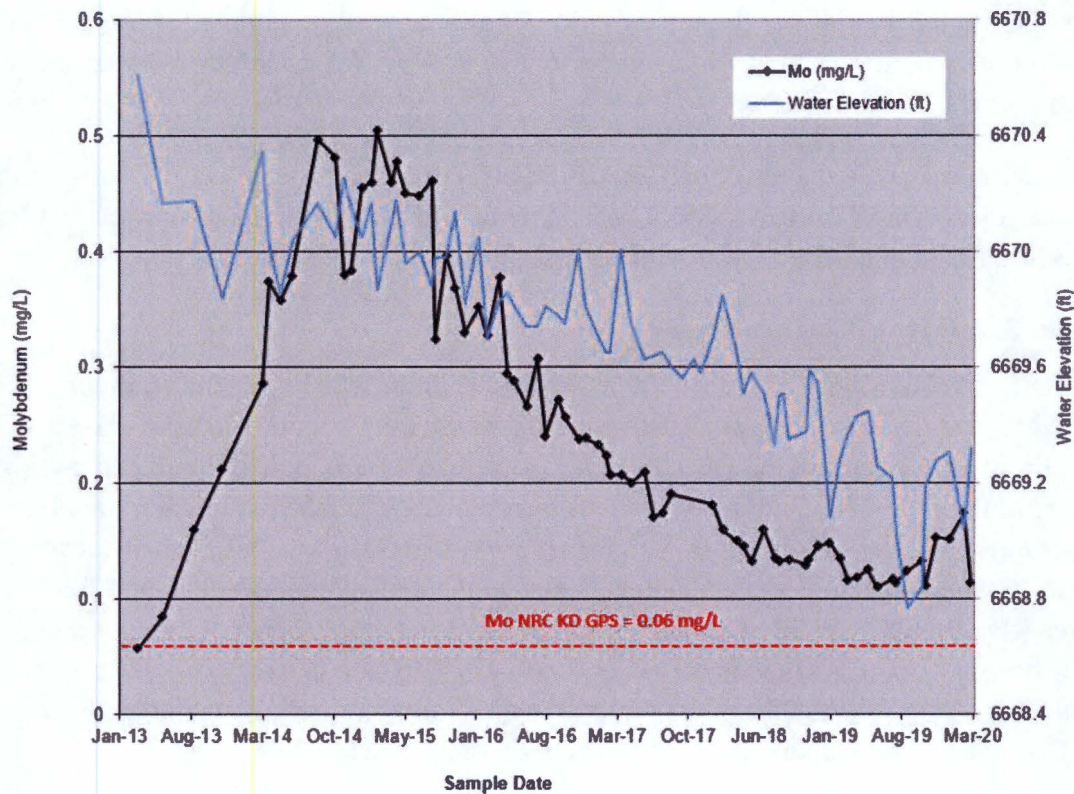


Figure 4. Molybdenum Concentrations in Dakota Sandstone Monitoring Well 32-45 KD-R.

**Tres Hermanos B Well 31-02 TRB-R**

Monitoring well 31-02 TRB-R is a replacement well that was installed in December 2012. Original well 31-02 TRB was sampled monthly for uranium and gross alpha. When the well was replaced, RAML continued to monitor for those constituents monthly.

Gross alpha activities in this well exceeded the GPS during the January monitoring event (Table 3). Uranium concentrations have remained below the ACL. Although uranium is well below the GPS, it is necessary to measure uranium concentrations in order to subtract the uranium activity from the gross alpha activity. RAML will continue monthly monitoring for gross alpha and uranium in well 31-02 TRB-R in accordance with monitoring requirements stated in SUA-1473.

Table 3. Gross Alpha in 31-02 TRB-R.

Date	Well 31-02 TRB-R
	Gross Alpha (pCi/L)
<b>GPS/ACL</b>	<b>21 (GPS)</b>
1/13/20	<b>39</b>
2/25/20	4.7
3/18/20	4.0

**Notes:**

Exceedances are bolded.  
mg/L= milligrams per liter  
pCi/L=picoCuries per liter


The NRC has granted RAML an exemption from April and May monthly monitoring due to the ongoing COVID-19 global pandemic. The exemption is documented in a letter to RAML dated April 21, 2020, *Subject: Rio Algom Mining LLC, Ambrosia Lake West Facility, Request for Temporary Exemption of Monthly Groundwater Monitoring Due to COVID-19 Disease Global Pandemic, Source Material License SUA-1473, DOCKET 04008905 (ML20094F627).*

RAML will resume monthly monitoring in June 2020 for the following constituents:

- Gross alpha in well 36-06 KD.
- Molybdenum and gross alpha in well 32-45 KD-R.
- Gross alpha in well 31-02 TRB-R.

Please contact me with any questions.

Sincerely,  
**Rio Algom Mining LLC**

  
Sandra L. Ross, P.G.  
Site Manager

cc. Document Control  
Kurt Vollbrecht, NMED (email only)  
Bernadette Tsosie, DOE (email only)

Enclosure:  
Attachment 1 – Laboratory Analytical Results for Monthly GW Monitoring During First Quarter 2020 (provided on accompanying compact disc)

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**Attachment 1**  
**Laboratory Analytical Results for Monthly GW**  
**Monitoring During First Quarter 2020**  
**(provided on accompanying compact disc)**



January 28, 2020

Report to:  
Kent Applegate  
Rio Algom Mining Company  
P.O. Box 218  
Grants, NM 87020

Bill to:  
Accounts Payable  
Rio Algom Mining Company  
P.O. Box 218  
Grants, NM 87020

cc: Clark Short, Angela Persico, Michaela Gorospe

Project ID: 4508122295  
ACZ Project ID: L56866

Kent Applegate:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on January 14, 2020. This project has been assigned to ACZ's project number, L56866. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L56866. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after February 27, 2020. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed  
and approved this report.



**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 31-02-TRB-R

ACZ Sample ID: **L56866-01**

Date Sampled: 01/13/20 15:17

Date Received: 01/14/20

Sample Matrix: *Groundwater*

## Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Uranium, dissolved	M200.8 ICP-MS	1	0.0035			mg/L	0.0001	0.0005	01/20/20 14:57	enb

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 32-45-KD-R

ACZ Sample ID: **L56866-02**

Date Sampled: 01/13/20 16:17

Date Received: 01/14/20

Sample Matrix: Groundwater

## Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Molybdenum, dissolved	M200.8 ICP-MS	1	0.152			mg/L	0.0002	0.0005	01/20/20 15:00	enb
Uranium, dissolved	M200.8 ICP-MS	1	0.0444			mg/L	0.0001	0.0005	01/20/20 15:00	enb

### Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>Lower</i>	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
<i>MDL</i>	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>Upper</i>	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

### QC Sample Types

<i>AS</i>	Analytical Spike (Post Digestion)	<i>LCSWD</i>	Laboratory Control Sample - Water Duplicate
<i>ASD</i>	Analytical Spike (Post Digestion) Duplicate	<i>LFB</i>	Laboratory Fortified Blank
<i>CCB</i>	Continuing Calibration Blank	<i>LFM</i>	Laboratory Fortified Matrix
<i>CCV</i>	Continuing Calibration Verification standard	<i>LFMD</i>	Laboratory Fortified Matrix Duplicate
<i>DUP</i>	Sample Duplicate	<i>LRB</i>	Laboratory Reagent Blank
<i>ICB</i>	Initial Calibration Blank	<i>MS</i>	Matrix Spike
<i>ICV</i>	Initial Calibration Verification standard	<i>MSD</i>	Matrix Spike Duplicate
<i>ICSAB</i>	Inter-element Correction Standard - A plus B solutions	<i>PBS</i>	Prep Blank - Soil
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBW</i>	Prep Blank - Water
<i>LCSSD</i>	Laboratory Control Sample - Soil Duplicate	<i>PQV</i>	Practical Quantitation Verification standard
<i>LCSW</i>	Laboratory Control Sample - Water	<i>SDL</i>	Serial Dilution

### QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

### ACZ Qualifiers (Qual)

<i>B</i>	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
<i>H</i>	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
<i>L</i>	Target analyte response was below the laboratory defined negative threshold.
<i>U</i>	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

### Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

### Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf>

Rio Algom Mining Company

ACZ Project ID: L56866

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

**Molybdenum, dissolved**

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG490146</b>													
WG490146ICV	ICV	01/20/20 13:31	MS200114-2	.0199		.01918	mg/L	96	90	110			
WG490146ICB	ICB	01/20/20 13:34				U	mg/L		-0.00044	0.00044			
WG490146LFB	LFB	01/20/20 13:37	MS200120-3	.0501		.04636	mg/L	93	85	115			
L56865-01AS	AS	01/20/20 14:38	MS200120-3	.0501	.0034	.05026	mg/L	94	70	130			
L56865-01ASD	ASD	01/20/20 14:41	MS200120-3	.0501	.0034	.04757	mg/L	88	70	130	5	20	

**Uranium, dissolved**

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG490146</b>													
WG490146ICV	ICV	01/20/20 13:31	MS200114-2	.05		.04922	mg/L	98	90	110			
WG490146ICB	ICB	01/20/20 13:34				U	mg/L		-0.00022	0.00022			
WG490146LFB	LFB	01/20/20 13:37	MS200120-3	.05		.04758	mg/L	95	85	115			
L56865-01AS	AS	01/20/20 14:38	MS200120-3	.05	.0037	.05082	mg/L	94	70	130			
L56865-01ASD	ASD	01/20/20 14:41	MS200120-3	.05	.0037	.04771	mg/L	88	70	130	6	20	

Rio Algom Mining Company

ACZ Project ID: L56866

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
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No extended qualifiers associated with this analysis

### Rio Algom Mining Company

Project ID: 4508122295  
Sample ID: 31-02-TRB-R  
Locator:

ACZ Sample ID: **L56866-01**  
Date Sampled: 01/13/20 15:17  
Date Received: 01/14/20  
Sample Matrix: Groundwater

Gross Alpha - Corrected  
Calculation

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(±%)	LLD	Units	XQ	Analyst
Gross Alpha - Corrected	01/28/20 8:30		39			pCi/L		calc

Gross Alpha, dissolved  
M900.0

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(±%)	LLD	Units	XQ	Analyst
Gross Alpha, dissolved	01/22/20 0:04		41	32	96	pCi/L	*	isn

### Rio Algom Mining Company

Project ID: 4508122295

Sample ID: 32-45-KD-R

Locator:

ACZ Sample ID: L56866-02

Date Sampled: 01/13/20 16:17

Date Received: 01/14/20

Sample Matrix: Groundwater

Gross Alpha - Corrected

Prep Method:

Calculation

Parameter	Measure Date	Prep Date	Result	Error(±)	LLD	Units	XQ	Analyst
Gross Alpha - Corrected	01/28/20 8:30		90			pCi/L		calc

Gross Alpha, dissolved

Prep Method:

M900.0

Parameter	Measure Date	Prep Date	Result	Error(±)	LLD	Units	XQ	Analyst
Gross Alpha, dissolved	01/22/20 0:05		120	17	14	pCi/L	*	isn



### Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Error(+/-)</i>	Calculated sample specific uncertainty
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>LCL</i>	Lower Control Limit, in % (except for LCSS, mg/Kg)
<i>LLD</i>	Calculated sample specific Lower Limit of Detection
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
<i>RER</i>	Relative Error Ratio, calculation used for Dup. QC taking into account the error factor.
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>UCL</i>	Upper Control Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

### QC Sample Types

<i>DUP</i>	Sample Duplicate	<i>MS/MSD</i>	Matrix Spike/Matrix Spike Duplicate
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBS</i>	Prep Blank - Soil
<i>LCSW</i>	Laboratory Control Sample - Water	<i>PBW</i>	Prep Blank - Water

### QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Matrix Spikes	Determines sample matrix interferences, if any.

### ACZ Qualifiers (Qual)

H.	Analysis exceeded method hold time.
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### Method Prefix Reference

M	EPA methodology, including those under SDWA, CWA, and RCRA
SM	Standard Methods for the Examination of Water and Wastewater.
D	ASTM
RP	DOE
ESM	DOE/ESM

### Comments

- (1) Solid matrices are reported on a dry weight basis.
- (2) Preparation method: "Method" indicates preparation defined in analytical method.
- (3) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.

For a complete list of ACZ's Extended Qualifiers, please click:

<https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf>

Rio Algom Mining Company

ACZ Project ID: L56866

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Gross Alpha, dissolved

M900.0

Units: pCi/L

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Error	LLD	Found	Error	LLD	Rec%	Lower	Upper	RPD/RER	Limit	Qual
<b>WG490300</b>																
WG490300PBW	PBW	01/22/20						4.2	2	11			22			
WG490300LCSWA	LCSW	01/22/20	PCN60283	100				110	9	12	110	67	144			
L56866-02DUP	DUP-RPD	01/22/20			120	17	14	110	17	26				9	20	
L56907-01DUP	DUP-RPD	01/22/20			9.8	4.3	13	8.8	4.1	9.2				11	20	
L56907-02MSA	MS	01/22/20	PCN60283	100	0.36	2.1	7.7	34	7.2	15	34	67	144			M2

Rio Algom Mining Company

ACZ Project ID: L56866

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L56866-01	WG490300	Gross Alpha, dissolved	M900.0	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L56866-02	WG490300	Gross Alpha, dissolved	M900.0	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.

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Rio Algom Mining Company

ACZ Project ID: L56866

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No certification qualifiers associated with this analysis

Rio Algom Mining Company  
 4508122295

ACZ Project ID: L56866  
 Date Received: 01/14/2020 09:56  
 Received By:  
 Date Printed: 1/15/2020

**Receipt Verification**

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?			X
2) Is the Chain of Custody form or other directive shipping papers present?	X		
3) Does this project require special handling procedures such as CLP protocol?		X	
4) Are any samples NRC licensable material?			X
5) If samples are received past hold time, proceed with requested short hold time analyses?	X		
6) Is the Chain of Custody form complete and accurate?	X		
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?		X	

**Samples/Containers**

	YES	NO	NA
8) Are all containers intact and with no leaks?	X		
9) Are all labels on containers and are they intact and legible?	X		
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	X		
11) For preserved bottle types, was the pH checked and within limits? <sup>1</sup>	X		
12) Is there sufficient sample volume to perform all requested work?	X		
13) Is the custody seal intact on all containers?			X
14) Are samples that require zero headspace acceptable?			X
15) Are all sample containers appropriate for analytical requirements?	X		
16) Is there an Hg-1631 trip blank present?			X
17) Is there a VOA trip blank present?			X
18) Were all samples received within hold time?	X		

NA indicates Not Applicable

**Chain of Custody Related Remarks**

**Client Contact Remarks**

**Shipping Containers**

Cooler Id	Temp (°C)	Temp Criteria (°C)	Rad (µR/Hr)	Custody Seal Intact?
4556	2.7	NA	15	N/A

Was ice present in the shipment container(s)?

Yes - Wet ice was present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

Rio Algom Mining Company  
4508122295

ACZ Project ID: L56866  
Date Received: 01/14/2020 09:56  
Received By:  
Date Printed: 1/15/2020

<sup>1</sup> The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).



Laboratories, Inc. L56866

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Kent Applegate
Company: Rio Algom Mining LLC
E-mail: Kent.KC.Applegate@bhpbilliton.com

Address: PO Box 218
Grants, NM 87020
Telephone: 1-505-287-8851

Copy of Report to:

Name: Michaela Gorospe/Clark Short
Company: INTERA, INC.

E-mail: See remarks
Telephone: 505-246-1600 x1207

Invoice to:

Name: Kent Applegate
Company: Rio Algom Mining LLC
E-mail: Kent.KC.Applegate@BHPBilliton.com

Address: PO Box 218
Grants, NM 87020
Telephone: 1-505-287-8851

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES [ ] NO [ ]

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

Are samples for SDWA Compliance Monitoring? Yes [ ] No [ ]

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: C. Short Sampler's Site Information State NM Zip code 87020 Time Zone MST

\*Sampler's Signature: [Signature] I attest to the authenticity and validity of this sample. I understand that intentionally mislabeling the time/date/location or tampering with the sample in anyway, is considered fraud and punishable by State law.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Table with columns: Quote #, PO#, Reporting state, Matrix, # of Containers, and multiple analysis columns. Includes handwritten entries for PO# 4502696253 and sample IDs 31-02-TRB-R and 32-45-KD-R.

Matrix SW (Surface Water) - GW (Ground Water) - WW (Waste Water) - DW (Drinking Water) - SL (Sludge) - SO (Soil) - OL (Oil) - Other (Specify)

REMARKS

RAML COC#: 2φ-φ1. Note different COC's may have different PO's. Shipment of 1 Coolers. Please CC report to: cshort@intera.com, apersico@intera.com, Michaela.Gorospe@bhpbilliton.com

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table for Relinquished and Received by, including signatures and dates: Relinquished by [Signature] 1/13/20, Received by [Signature] 1-14-2020.

FRMAD050.06.14.14

White - Return with sample. Yellow - Retain for your records.

56866 Chain of Custody

April 24, 2020

## Report to:

Kent Applegate  
Rio Algom Mining Company  
P.O. Box 218  
Grants, NM 87020

## Bill to:

Accounts Payable  
Rio Algom Mining Company  
P.O. Box 218  
Grants, NM 87020

cc: Clark Short, Angela Persico, Michaelia Gorospe

Project ID: 4508122295

ACZ Project ID: L56786

Kent Applegate:

Enclosed are revised analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on January 09, 2020 and originally reported on April 24, 2020. Refer to the case narrative for an explanation of the changes. This project was assigned to ACZ's project number, L56786. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L56786. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after May 24, 2020. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than \$10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed  
and approved this report.





Rio Algom Mining Company

April 24, 2020

Project ID: 4508122295

ACZ Project ID: L56786

**Sample Receipt**

ACZ Laboratories, Inc. (ACZ) received 1 groundwater sample from Rio Algom Mining Company on January 9, 2020. The sample was received in good condition. Upon receipt, the sample custodian removed the sample from the cooler, inspected the contents, and logged the sample into ACZ's computerized Laboratory Information Management System (LIMS). The sample was assigned ACZ LIMS project number L56786. The custodian verified the sample information entered into the computer against the chain of custody (COC) forms and sample bottle labels.

**Holding Times**

All analyses were performed within EPA recommended holding times.

**Sample Analysis**

This sample was analyzed for inorganic, radiochemistry parameters. The individual methods are referenced on both, the ACZ invoice and the analytical reports. The extended qualifier reports may contain footnotes qualifying specific elements due to QC failures. In addition the following has been noted with this specific project:

1. This project has been revised to include a re-analysis for Cadmium.

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 36-06 KD

ACZ Sample ID: **L56786-01**

Date Sampled: 01/07/20 11:35

Date Received: 01/09/20

Sample Matrix: *Groundwater*

## Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Beryllium, dissolved	M200.8 ICP-MS	1	0.00712			mg/L	0.00008	0.0003	01/17/20 13:46	enb
Cadmium, dissolved	M200.8 ICP-MS	1	0.00479			mg/L	0.00005	0.0003	04/23/20 13:31	bsu
Uranium, dissolved	M200.8 ICP-MS	1	0.477			mg/L	0.0001	0.0005	01/17/20 13:46	enb

### Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>Lower</i>	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
<i>MDL</i>	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>Upper</i>	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

### QC Sample Types

<i>AS</i>	Analytical Spike (Post Digestion)	<i>LCSWD</i>	Laboratory Control Sample - Water Duplicate
<i>ASD</i>	Analytical Spike (Post Digestion) Duplicate	<i>LFB</i>	Laboratory Fortified Blank
<i>CCB</i>	Continuing Calibration Blank	<i>LFM</i>	Laboratory Fortified Matrix
<i>CCV</i>	Continuing Calibration Verification standard	<i>LFMD</i>	Laboratory Fortified Matrix Duplicate
<i>DUP</i>	Sample Duplicate	<i>LRB</i>	Laboratory Reagent Blank
<i>ICB</i>	Initial Calibration Blank	<i>MS</i>	Matrix Spike
<i>ICV</i>	Initial Calibration Verification standard	<i>MSD</i>	Matrix Spike Duplicate
<i>ICSAB</i>	Inter-element Correction Standard - A plus B solutions	<i>PBS</i>	Prep Blank - Soil
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBW</i>	Prep Blank - Water
<i>LCSSD</i>	Laboratory Control Sample - Soil Duplicate	<i>PQV</i>	Practical Quantitation Verification standard
<i>LCSW</i>	Laboratory Control Sample - Water	<i>SDL</i>	Serial Dilution

### QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

### ACZ Qualifiers (Qual)

<b>B</b>	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
<b>H</b>	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
<b>L</b>	Target analyte response was below the laboratory defined negative threshold.
<b>U</b>	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

### Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

### Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf>

Rio Algom Mining Company

ACZ Project ID: L56786

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

**Beryllium, dissolved** M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG490111</b>													
WG490111ICV	ICV	01/17/20 13:37	MS200114-2	.05		.04683	mg/L	94	90	110			
WG490111ICB	ICB	01/17/20 13:40				.000163	mg/L		-0.000176	0.000176			
WG490111LFB	LFB	01/17/20 13:43	MS191119-5	.05005		.04952	mg/L	99	85	115			
L56815-02AS	AS	01/17/20 14:02	MS191119-5	.1001	U	.09082	mg/L	91	70	130			
L56815-02ASD	ASD	01/17/20 14:05	MS191119-5	.1001	U	.09692	mg/L	-97	70	130	6	20	

**Cadmium, dissolved** M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG496022</b>													
WG496022ICV	ICV	04/23/20 13:22	MS200331-1	.05		.051135	mg/L	102	90	110			
WG496022ICB	ICB	04/23/20 13:24				U	mg/L		-0.00011	0.00011			
WG496022LFB	LFB	04/23/20 13:25	MS200421-3	.05005		.04689	mg/L	94	85	115			
L58115-04AS	AS	04/23/20 13:36	MS200421-3	.05005	.00009	.048199	mg/L	96	70	130			
L58115-04ASD	ASD	04/23/20 13:38	MS200421-3	.05005	.00009	.050967	mg/L	-102	70	130	6	20	

**Uranium, dissolved** M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG490111</b>													
WG490111ICV	ICV	01/17/20 13:37	MS200114-2	.05		.04566	mg/L	91	90	110			
WG490111ICB	ICB	01/17/20 13:40				U	mg/L		-0.00022	0.00022			
WG490111LFB	LFB	01/17/20 13:43	MS191119-5	.05		.04707	mg/L	94	85	115			
L56815-02AS	AS	01/17/20 14:02	MS191119-5	.1	U	.08884	mg/L	89	70	130			
L56815-02ASD	ASD	01/17/20 14:05	MS191119-5	.1	U	.09282	mg/L	93	70	130	4	20	

Rio Algom Mining Company

ACZ Project ID: L56786

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
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No extended qualifiers associated with this analysis

### Rio Algom Mining Company

Project ID: 4508122295

Sample ID: 36-06 KD

Locator:

ACZ Sample ID: L56786-01

Date Sampled: 01/07/20 11:35

Date Received: 01/09/20

Sample Matrix: Groundwater

Gross Alpha - Corrected

Prep Method:

Calculation

Parameter	Measure Date	Prep Date	Result	Error(%)	LLD	Units	XQ	Analyst
Gross Alpha - Corrected	01/21/20 8:53		40			pCi/L		calc

Gross Alpha, dissolved

Prep Method:

M900.0

Parameter	Measure Date	Prep Date	Result	Error(%)	LLD	Units	XQ	Analyst
Gross Alpha, dissolved	01/16/20 0:04		360	58	58	pCi/L		isn

### Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Error(+/-)</i>	Calculated sample specific uncertainty
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>LCL</i>	Lower Control Limit, in % (except for LCSS, mg/Kg)
<i>LLD</i>	Calculated sample specific Lower Limit of Detection
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
<i>RER</i>	Relative Error Ratio, calculation used for Dup. QC taking into account the error factor.
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>UCL</i>	Upper Control Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

### QC Sample Types

<i>DUP</i>	Sample Duplicate	<i>MS/MSD</i>	Matrix Spike/Matrix Spike Duplicate
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBS</i>	Prep Blank - Soil
<i>LCSW</i>	Laboratory Control Sample - Water	<i>PBW</i>	Prep Blank - Water

### QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Matrix Spikes	Determines sample matrix interferences, if any.

### ACZ Qualifiers (Qual)

H.	Analysis exceeded method hold time.
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### Method Prefix Reference

M	EPA methodology, including those under SDWA, CWA, and RCRA
SM	Standard Methods for the Examination of Water and Wastewater.
D	ASTM
RP	DOE
ESM	DOE/ESM

### Comments

- (1) Solid matrices are reported on a dry weight basis.
- (2) Preparation method: "Method" indicates preparation defined in analytical method.
- (3) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.

For a complete list of ACZ's Extended Qualifiers, please click:

<https://aczk.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf>

Rio Algom Mining Company

ACZ Project ID: L56786

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Gross Alpha, dissolved

M900.0

Units: pCi/L

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Error	LLD	Found	Error	LLD	Rec%	Lower	Upper	RPD/RER	Limit	Qual
<b>WG489738</b>																
WG489738PBW	PBW	01/16/20						-32	0.53	0.93			1.86			
WG489738LCSWA	LCSW	01/16/20	PCN60283	100				110	9	1.6	110	67	144			
L56786-01DUP	DUP-RPD	01/16/20			360	58	58	400	62	52				11	20	
L56787-01MSA	MS	01/16/20	PCN60283	100	-0.65	0.96	8.8	120	9.9	4.3	121	67	144			



Rio Algom Mining Company

ACZ Project ID: **L56786**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
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No extended qualifiers associated with this analysis

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Rio Algom Mining Company

ACZ Project ID: L56786

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No certification qualifiers associated with this analysis

Rio Algom Mining Company  
 4508122295

ACZ Project ID: L56786  
 Date Received: 01/09/2020 11:55  
 Received By:  
 Date Printed: 1/10/2020

**Receipt Verification**

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?			X
2) Is the Chain of Custody form or other directive shipping papers present?	X		
3) Does this project require special handling procedures such as CLP protocol?		X	
4) Are any samples NRC licensable material?			X
5) If samples are received past hold time, proceed with requested short hold time analyses?		X	
6) Is the Chain of Custody form complete and accurate?	X		
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?		X	

**Samples/Containers**

	YES	NO	NA
8) Are all containers intact and with no leaks?	X		
9) Are all labels on containers and are they intact and legible?	X		
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	X		
11) For preserved bottle types, was the pH checked and within limits? <sup>1</sup>	X		
12) Is there sufficient sample volume to perform all requested work?	X		
13) Is the custody seal intact on all containers?			X
14) Are samples that require zero headspace acceptable?			X
15) Are all sample containers appropriate for analytical requirements?	X		
16) Is there an Hg-1631 trip blank present?			X
17) Is there a VOA trip blank present?			X
18) Were all samples received within hold time?	X		

NA indicates Not Applicable

**Chain of Custody Related Remarks**

**Client Contact Remarks**

**Shipping Containers**

Cooler Id	Temp (°C)	Temp Criteria (°C)	Rad (µR/Hr)	Custody Seal Intact?
NA32126	3.9	NA	15	Yes

Was ice present in the shipment container(s)?

Yes - Wet ice was present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

Rio Algom Mining Company  
4508122295

ACZ Project ID: L56786  
Date Received: 01/09/2020 11:55  
Received By:  
Date Printed: 1/10/2020

<sup>1</sup> The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).



Laboratories, Inc. L 56786

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Kent Applegate
Company: Rio Algom Mining LLC
E-mail: Kent.KC.Applegate@bhpbilliton.com

Address: PO Box 218
Grants, NM 87020
Telephone: 1-505-287-8851

Copy of Report to:

Name: Michaela Gorospe/Clark Short
Company: INTERA, INC.

E-mail: See remarks
Telephone: 505-246-1600 x1207

Invoice to:

Name: Kent Applegate
Company: Rio Algom Mining LLC
E-mail: Kent.KC.Applegate@BHPBilliton.com

Address: PO Box 218
Grants, NM 87020
Telephone: 1-505-287-8851

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES [X] NO [ ]

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified

Are samples for SDWA Compliance Monitoring? Yes [ ] No [X]

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: B. W. Williamson Sampler's Site Information State NM Zip code 87020 Time Zone MST

\*Sampler's Signature: [Signature] \*Intent to the authenticity and validity of this sample. I understand that intentionally mislabeling the time/date/location or tampering with the sample in anyway, is considered fraud and punishable by State Law.

PROJECT INFORMATION

ANALYSES REQUESTED (check box or use quote number)

Quote #:
PO#: 4502696253
Reporting state for compliance testing:
Check box if samples include NRC licensed material? [X]

Table with columns: SAMPLE IDENTIFICATION, DATE:TIME, Matrix, # of Containers, SAP-GW, and 12 analysis columns. Row 1: 36-06 KD, 1/7/2020 11:35, GW, 2, [X] in SAP-GW and 36-06 KD columns.

Matrix SW (Surface Water) - GW (Ground Water) - WW (Waste Water) - DW (Drinking Water) - SL (Sludge) - SO (Soil) - OL (Oil) - Other (Specify)

REMARKS

RAML COC#: 19-58. Note different COC's may have different PO's. Shipment of 1 Coolers.
Please CC report to: cshort@intera.com, apersico@intera.com, Michaela.Gorospe@bhpbilliton.com

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with 4 columns: RELINQUISHED BY, DATE:TIME, RECEIVED BY, DATE:TIME. Includes signatures and dates like 1/8/2020 09:30 and 1/8/20.

FRMAD050.06.14.14

White - Return with sample. Yellow - Retain for your records.

56786 Chain of Custody

March 26, 2020

Report to:  
Kent Applegate  
Rio Algom Mining Company  
P.O. Box 218  
Grants, NM 87020

Bill to:  
Accounts Payable  
Rio Algom Mining Company  
P.O. Box 218  
Grants, NM 87020

cc: Clark Short, Angela Persico, Michaela Gorospe, jcarroll

Project ID: 4508122295  
ACZ Project ID: L57691

Kent Applegate:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on February 29, 2020. This project has been assigned to ACZ's project number, L57691. Please reference this number in all future inquiries.

All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L57691. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after April 25, 2020. If the samples are determined to be hazardous, additional charges apply for disposal (typically \$11/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical raw data reports for ten years.

If you have any questions or other needs, please contact your Project Manager.

*S. Habermehl*

Scott Habermehl has reviewed and approved this report.



### Rio Algom Mining Company

Project ID: 4508122295

Sample ID: 31-02 TRB

ACZ Sample ID: **L57691-01**

Date Sampled: 02/25/20 10:20

Date Received: 02/29/20

Sample Matrix: Groundwater

#### Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	5	673			mg/L	0.5	3	03/17/20 23:18	kja
Iron, dissolved	M200.7 ICP	5	6.4			mg/L	0.2	0.4	03/18/20 11:06	kja
Magnesium, dissolved	M200.7 ICP	5	769			mg/L	1	5	03/17/20 23:18	kja
Molybdenum, dissolved	M200.8 ICP-MS	5		U		mg/L	0.001	0.003	03/12/20 18:30	mfm
Nickel, dissolved	M200.8 ICP-MS	5		U		mg/L	0.002	0.005	03/12/20 18:30	mfm
Potassium, dissolved	M200.7 ICP	5	19			mg/L	1	5	03/17/20 23:18	kja
Selenium, dissolved	SM 3114 B, AA-Hydride	1		U		mg/L	0.001	0.005	03/06/20 14:47	slm
Sodium, dissolved	M200.7 ICP	5	632			mg/L	1	5	03/17/20 23:18	kja
Uranium, dissolved	M200.8 ICP-MS	5	0.004			mg/L	0.0005	0.003	03/12/20 18:30	mfm

#### Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	1150			mg/L	2	20	03/04/20 0:00	nmc
Carbonate as CaCO3		1		U		mg/L	2	20	03/04/20 0:00	nmc
Hydroxide as CaCO3		1		U		mg/L	2	20	03/04/20 0:00	nmc
Total Alkalinity		1	1150			mg/L	2	20	03/04/20 0:00	nmc
Cation-Anion Balance	Calculation									
Cation-Anion Balance			2.0			%			03/26/20 0:00	calc
Sum of Anions			120			meq/L			03/26/20 0:00	calc
Sum of Cations			125			meq/L			03/26/20 0:00	calc
Chloride	SM4500Cl-E	120	1030			mg/L	60	200	03/16/20 9:28	rbt
Conductivity @25C	SM2510B	1	8670			umhos/cm	1	10	03/06/20 20:41	eep
Cyanide, Total	D7511-09	1		U	*	mg/L	0.003	0.01	03/04/20 14:17	rbt
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	1	0.07	B	*	mg/L	0.02	0.1	03/19/20 0:04	pjb
Residue, Filterable (TDS) @180C	SM2540C	5	7740			mg/L	100	200	03/02/20 18:57	jck
Sulfate	D516-02-07/11 - Turbidimetric	120	3230			mg/L	120	600	03/12/20 10:18	rbt
TDS (calculated)	Calculation		7060			mg/L			03/26/20 0:00	calc
TDS (ratio - measured/calculated)	Calculation		1.10						03/26/20 0:00	calc

### Rio Algom Mining Company

Project ID: 4508122295

Sample ID: 13-20 TRB

ACZ Sample ID: **L57691-02**

Date Sampled: 02/25/20 09:20

Date Received: 02/29/20

Sample Matrix: Groundwater

#### Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	5	667			mg/L	0.5	3	03/17/20 23:22	kja
Iron, dissolved	M200.7 ICP	5	6.2			mg/L	0.2	0.4	03/18/20 11:09	kja
Magnesium, dissolved	M200.7 ICP	5	763			mg/L	1	5	03/17/20 23:22	kja
Molybdenum, dissolved	M200.8 ICP-MS	5		U		mg/L	0.001	0.003	03/12/20 18:32	mfm
Nickel, dissolved	M200.8 ICP-MS	5		U		mg/L	0.002	0.005	03/12/20 18:32	mfm
Potassium, dissolved	M200.7 ICP	5	19			mg/L	1	5	03/17/20 23:22	kja
Selenium, dissolved	SM 3114 B, AA-Hydride	1		U		mg/L	0.001	0.005	03/06/20 14:54	slm
Sodium, dissolved	M200.7 ICP	5	628			mg/L	1	5	03/17/20 23:22	kja
Uranium, dissolved	M200.8 ICP-MS	5	0.0039			mg/L	0.0005	0.003	03/12/20 18:32	mfm

#### Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	1140			mg/L	2	20	03/04/20 0:00	nmc
Carbonate as CaCO3		1		U		mg/L	2	20	03/04/20 0:00	nmc
Hydroxide as CaCO3		1		U		mg/L	2	20	03/04/20 0:00	nmc
Total Alkalinity		1	1140			mg/L	2	20	03/04/20 0:00	nmc
Cation-Anion Balance	Calculation									
Cation-Anion Balance			2.1			%			03/26/20 0:00	calc
Sum of Anions			119			meq/L			03/26/20 0:00	calc
Sum of Cations			124			meq/L			03/26/20 0:00	calc
Chloride	SM4500Cl-E	120	1060		*	mg/L	60	200	03/16/20 9:28	rbt
Conductivity @25C	SM2510B	1	8670			umhos/cm	1	10	03/06/20 20:43	eep
Cyanide, Total	D7511-09	1		U	*	mg/L	0.003	0.01	03/04/20 14:19	rbt
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	1	0.07	B	*	mg/L	0.02	0.1	03/19/20 0:10	pjb
Residue, Filterable (TDS) @180C	SM2540C	5	7700			mg/L	100	200	03/02/20 18:59	jck
Sulfate	D516-02/-07/-11 - Turbidimetric	120	3190			mg/L	120	600	03/12/20 10:18	rbt
TDS (calculated)	Calculation		7030			mg/L			03/26/20 0:00	calc
TDS (ratio - measured/calculated)	Calculation		1.10						03/26/20 0:00	calc



**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 31-01 TRA

ACZ Sample ID: **L57691-03**

Date Sampled: 02/25/20 11:47

Date Received: 02/29/20

Sample Matrix: Groundwater

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	1	198			mg/L	0.1	0.5	03/17/20 23:25	kja
Iron, dissolved	M200.7 ICP	1		U		mg/L	0.03	0.08	03/18/20 11:12	kja
Magnesium, dissolved	M200.7 ICP	1	84.7			mg/L	0.2	1	03/17/20 23:25	kja
Molybdenum, dissolved	M200.8 ICP-MS	1	0.0072			mg/L	0.0002	0.0005	03/12/20 18:34	mfm
Nickel, dissolved	M200.8 ICP-MS	1	0.0052			mg/L	0.0004	0.001	03/12/20 18:34	mfm
Potassium, dissolved	M200.7 ICP	1	6.2			mg/L	0.2	1	03/17/20 23:25	kja
Selenium, dissolved	SM 3114 B, AA-Hydride	1		U		mg/L	0.001	0.005	03/06/20 14:56	slm
Sodium, dissolved	M200.7 ICP	1	144			mg/L	0.2	1	03/17/20 23:25	kja
Uranium, dissolved	M200.8 ICP-MS	1	0.0005			mg/L	0.0001	0.0005	03/12/20 18:34	mfm

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	150			mg/L	2	20	03/04/20 0:00	nmc
Carbonate as CaCO3		1		U		mg/L	2	20	03/04/20 0:00	nmc
Hydroxide as CaCO3		1		U		mg/L	2	20	03/04/20 0:00	nmc
Total Alkalinity		1	150		*	mg/L	2	20	03/04/20 0:00	nmc
Cation-Anion Balance	Calculation									
Cation-Anion Balance			0.0			%			03/26/20 0:00	calc
Sum of Anions			23			meq/L			03/26/20 0:00	calc
Sum of Cations			23			meq/L			03/26/20 0:00	calc
Chloride	SM4500Cl-E	1	17.6		*	mg/L	0.5	2	03/16/20 9:09	rbt
Conductivity @25C	SM2510B	1	1960			umhos/cm	1	10	03/06/20 20:46	eep
Cyanide, Total	D7511-09	1		U		mg/L	0.003	0.01	03/04/20 14:21	rbt
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	1		U	*	mg/L	0.02	0.1	03/19/20 0:11	pjb
Residue, Filterable (TDS) @180C	SM2540C	1	1660			mg/L	20	40	03/02/20 19:02	jck
Sulfate	D516-02/-07/-11 - Turbidimetric	25	949		*	mg/L	25	125	03/12/20 10:07	rbt
TDS (calculated)	Calculation		1490			mg/L			03/26/20 0:00	calc
TDS (ratio - measured/calculated)	Calculation		1.11						03/26/20 0:00	calc

### Rio Algom Mining Company

Project ID: 4508122295

Sample ID: 36-06 KD

ACZ Sample ID: **L57691-04**

Date Sampled: 02/25/20 14:07

Date Received: 02/29/20

Sample Matrix: Groundwater

#### Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Antimony, dissolved	M200.8 ICP-MS	5		U		mg/L	0.002	0.01	03/12/20 18:36	mfm
Arsenic, dissolved	M200.8 ICP-MS	5	0.012			mg/L	0.001	0.005	03/12/20 18:36	mfm
Barium, dissolved	M200.7 ICP	5		U		mg/L	0.04	0.2	03/17/20 23:28	kja
Beryllium, dissolved	M200.8 ICP-MS	5	0.0067			mg/L	0.0004	0.001	03/12/20 18:36	mfm
Cadmium, dissolved	M200.8 ICP-MS	5	0.0052			mg/L	0.0003	0.001	03/12/20 18:36	mfm
Calcium, dissolved	M200.7 ICP	5	532			mg/L	0.5	3	03/17/20 23:28	kja
Iron, dissolved	M200.7 ICP	5	1.4			mg/L	0.2	0.4	03/18/20 11:15	kja
Lead, dissolved	M200.8 ICP-MS	5	0.0142			mg/L	0.0005	0.003	03/12/20 18:36	mfm
Magnesium, dissolved	M200.7 ICP	5	342			mg/L	1	5	03/17/20 23:28	kja
Molybdenum, dissolved	M200.8 ICP-MS	5		U		mg/L	0.001	0.003	03/12/20 18:36	mfm
Nickel, dissolved	M200.8 ICP-MS	5	0.104			mg/L	0.002	0.005	03/12/20 18:36	mfm
Potassium, dissolved	M200.7 ICP	5	12			mg/L	1	5	03/17/20 23:28	kja
Selenium, dissolved	SM 3114 B, AA-Hydride	1	0.0016	B		mg/L	0.001	0.005	03/06/20 14:58	slm
Sodium, dissolved	M200.7 ICP	5	504			mg/L	1	5	03/17/20 23:28	kja
Uranium, dissolved	M200.8 ICP-MS	5	0.441			mg/L	0.0005	0.003	03/12/20 18:36	mfm

#### Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1		U		mg/L	2	20	03/04/20 0:00	nmc
Carbonate as CaCO3		1		U		mg/L	2	20	03/04/20 0:00	nmc
Hydroxide as CaCO3		1		U		mg/L	2	20	03/04/20 0:00	nmc
Total Alkalinity		1		U	*	mg/L	2	20	03/04/20 0:00	nmc
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-5.5			%			03/26/20 0:00	calc
Sum of Anions			86			meq/L			03/26/20 0:00	calc
Sum of Cations			77			meq/L			03/26/20 0:00	calc
Chloride	SM4500Cl-E	10	957		*	mg/L	5	20	03/16/20 9:30	rbt
Conductivity @25C	SM2510B	1	7030			umhos/cm	1	10	03/06/20 20:48	eep
Cyanide, Total	D7511-09	1		U		mg/L	0.003	0.01	03/04/20 14:23	rbt
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	1		U	*	mg/L	0.02	0.1	03/19/20 0:12	pjb
Residue, Filterable (TDS) @180C	SM2540C	5	6070			mg/L	100	200	03/02/20 19:04	jck
Sulfate	D516-02/-07/-11 - Turbidimetric	120	2800		*	mg/L	120	600	03/12/20 10:55	rbt
TDS (calculated)	Calculation		5150			mg/L			03/26/20 0:00	calc
TDS (ratio - measured/calculated)	Calculation		1.18						03/26/20 0:00	calc

**Rio Algom Mining Company**

Project ID: 4508122295  
 Sample ID: 17-01 KD

ACZ Sample ID: **L57691-05**  
 Date Sampled: 02/27/20 09:21  
 Date Received: 02/29/20  
 Sample Matrix: Groundwater

**Metals Analysis**

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Antimony, dissolved	M200.8 ICP-MS	1		U		mg/L	0.0004	0.002	03/12/20 18:38	mfm
Arsenic, dissolved	M200.8 ICP-MS	1		U		mg/L	0.0002	0.001	03/12/20 18:38	mfm
Barium, dissolved	M200.7 ICP	1	0.014	B		mg/L	0.007	0.04	03/17/20 23:31	kja
Beryllium, dissolved	M200.8 ICP-MS	1		U		mg/L	0.00008	0.0003	03/12/20 18:38	mfm
Cadmium, dissolved	M200.8 ICP-MS	1		U		mg/L	0.00005	0.0003	03/12/20 18:38	mfm
Calcium, dissolved	M200.7 ICP	1	77.8			mg/L	0.1	0.5	03/17/20 23:31	kja
Iron, dissolved	M200.7 ICP	1	0.03	B		mg/L	0.03	0.08	03/18/20 11:18	kja
Lead, dissolved	M200.8 ICP-MS	1		U		mg/L	0.0001	0.0005	03/12/20 18:38	mfm
Magnesium, dissolved	M200.7 ICP	1	41.7			mg/L	0.2	1	03/17/20 23:31	kja
Molybdenum, dissolved	M200.8 ICP-MS	1	0.0013			mg/L	0.0002	0.0005	03/12/20 18:38	mfm
Nickel, dissolved	M200.8 ICP-MS	1		U		mg/L	0.0004	0.001	03/12/20 18:38	mfm
Potassium, dissolved	M200.7 ICP	1	6.6			mg/L	0.2	1	03/17/20 23:31	kja
Selenium, dissolved	SM 3114 B, AA-Hydride	1		U		mg/L	0.001	0.005	03/06/20 15:00	slm
Sodium, dissolved	M200.7 ICP	1	227			mg/L	0.2	1	03/17/20 23:31	kja
Uranium, dissolved	M200.8 ICP-MS	1		U		mg/L	0.0001	0.0005	03/12/20 18:38	mfm

**Wet Chemistry**

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	61.5			mg/L	2	20	03/04/20 0:00	nmc
Carbonate as CaCO3		1	5.9	B		mg/L	2	20	03/04/20 0:00	nmc
Hydroxide as CaCO3		1		U		mg/L	2	20	03/04/20 0:00	nmc
Total Alkalinity		1	67.4		*	mg/L	2	20	03/04/20 0:00	nmc
Cation-Anion Balance	Calculation									
Cation-Anion Balance			0.0			%			03/26/20 0:00	calc
Sum of Anions			18			meq/L			03/26/20 0:00	calc
Sum of Cations			18			meq/L			03/26/20 0:00	calc
Chloride	SM4500Cl-E	1	11.9		*	mg/L	0.5	2	03/16/20 9:20	rbt
Conductivity @25C	SM2510B	1	1690			umhos/cm	1	10	03/06/20 20:50	eep
Cyanide, Total	D7511-09	1		U		mg/L	0.003	0.01	03/04/20 14:31	rbt
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	1		U	*	mg/L	0.02	0.1	03/19/20 0:14	pjb
Residue, Filterable (TDS) @180C	SM2540C	2	1220			mg/L	40	80	03/02/20 19:07	jck
Sulfate	D516-02/07/11 - Turbidimetric	25	753		*	mg/L	25	125	03/12/20 10:44	rbt
TDS (calculated)	Calculation		1160			mg/L			03/26/20 0:00	calc
TDS (ratio - measured/calculated)	Calculation		1.05						03/26/20 0:00	calc

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 32-45 KD-R

ACZ Sample ID: **L57691-06**

Date Sampled: 02/27/20 11:11

Date Received: 02/29/20

Sample Matrix: Groundwater

**Metals Analysis**

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Antimony, dissolved	M200.8 ICP-MS	1	0.0007	B		mg/L	0.0004	0.002	03/12/20 18:39	mfm
Arsenic, dissolved	M200.8 ICP-MS	1	0.0003	B		mg/L	0.0002	0.001	03/12/20 18:39	mfm
Barium, dissolved	M200.7 ICP	1	0.027	B		mg/L	0.007	0.04	03/17/20 23:41	kja
Beryllium, dissolved	M200.8 ICP-MS	1		U		mg/L	0.00008	0.0003	03/12/20 18:39	mfm
Cadmium, dissolved	M200.8 ICP-MS	1	0.00007	B		mg/L	0.00005	0.0003	03/12/20 18:39	mfm
Calcium, dissolved	M200.7 ICP	1	215			mg/L	0.1	0.5	03/17/20 23:41	kja
Iron, dissolved	M200.7 ICP	1		U		mg/L	0.03	0.08	03/18/20 11:27	kja
Lead, dissolved	M200.8 ICP-MS	1		U		mg/L	0.0001	0.0005	03/12/20 18:39	mfm
Magnesium, dissolved	M200.7 ICP	1	54.1			mg/L	0.2	1	03/17/20 23:41	kja
Molybdenum, dissolved	M200.8 ICP-MS	1	0.174			mg/L	0.0002	0.0005	03/12/20 18:39	mfm
Nickel, dissolved	M200.8 ICP-MS	1	0.0015			mg/L	0.0004	0.001	03/12/20 18:39	mfm
Potassium, dissolved	M200.7 ICP	1	7.0			mg/L	0.2	1	03/17/20 23:41	kja
Selenium, dissolved	SM 3114 B, AA-Hydride	1		U		mg/L	0.001	0.005	03/06/20 15:02	slm
Sodium, dissolved	M200.7 ICP	1	166			mg/L	0.2	1	03/17/20 23:41	kja
Uranium, dissolved	M200.8 ICP-MS	1	0.0493			mg/L	0.0001	0.0005	03/12/20 18:39	mfm

**Wet Chemistry**

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	359			mg/L	2	20	03/04/20 0:00	nmc
Carbonate as CaCO3		1		U		mg/L	2	20	03/04/20 0:00	nmc
Hydroxide as CaCO3		1		U		mg/L	2	20	03/04/20 0:00	nmc
Total Alkalinity		1	359		*	mg/L	2	20	03/04/20 0:00	nmc
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-2.1			%			03/26/20 0:00	calc
Sum of Anions			24			meq/L			03/26/20 0:00	calc
Sum of Cations			23			meq/L			03/26/20 0:00	calc
Chloride	SM4500Cl-E	1	81.4		*	mg/L	0.5	2	03/16/20 9:20	rft
Conductivity @25C	SM2510B	1	1950			umhos/cm	1	10	03/06/20 20:52	eep
Cyanide, Total	D7511-09	1		U		mg/L	0.003	0.01	03/04/20 14:33	rft
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	1	0.51		*	mg/L	0.02	0.1	03/19/20 0:15	pjb
Residue, Filterable (TDS) @180C	SM2540C	1	1490			mg/L	20	40	03/03/20 18:17	jck
Sulfate	D516-02/07/11 - Turbidimetric	25	688		*	mg/L	25	125	03/12/20 10:46	rft
TDS (calculated)	Calculation		1430			mg/L			03/26/20 0:00	calc
TDS (ratio - measured/calculated)	Calculation		1.04						03/26/20 0:00	calc

### Rio Algom Mining Company

Project ID: 4508122295  
 Sample ID: 30-48 KD-R

ACZ Sample ID: **L57691-07**  
 Date Sampled: 02/27/20 12:16  
 Date Received: 02/29/20  
 Sample Matrix: Groundwater

#### Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Antimony, dissolved	M200.8 ICP-MS	5		U		mg/L	0.002	0.01	03/12/20 18:41	mfm
Arsenic, dissolved	M200.8 ICP-MS	5		U		mg/L	0.001	0.005	03/12/20 18:41	mfm
Barium, dissolved	M200.7 ICP	5		U		mg/L	0.04	0.2	03/17/20 23:51	kja
Beryllium, dissolved	M200.8 ICP-MS	5		U		mg/L	0.0004	0.001	03/12/20 18:41	mfm
Cadmium, dissolved	M200.8 ICP-MS	5		U		mg/L	0.0003	0.001	03/12/20 18:41	mfm
Calcium, dissolved	M200.7 ICP	5	571			mg/L	0.5	3	03/17/20 23:51	kja
Iron, dissolved	M200.7 ICP	5	3.0			mg/L	0.2	0.4	03/18/20 11:37	kja
Lead, dissolved	M200.8 ICP-MS	5		U		mg/L	0.0005	0.003	03/12/20 18:41	mfm
Magnesium, dissolved	M200.7 ICP	5	219			mg/L	1	5	03/17/20 23:51	kja
Molybdenum, dissolved	M200.8 ICP-MS	5	0.022			mg/L	0.001	0.003	03/12/20 18:41	mfm
Nickel, dissolved	M200.8 ICP-MS	5		U		mg/L	0.002	0.005	03/12/20 18:41	mfm
Potassium, dissolved	M200.7 ICP	5	9			mg/L	1	5	03/17/20 23:51	kja
Selenium, dissolved	SM 3114 B, AA-Hydride	1		U		mg/L	0.001	0.005	03/06/20 15:04	slm
Sodium, dissolved	M200.7 ICP	5	391			mg/L	1	5	03/17/20 23:51	kja
Uranium, dissolved	M200.8 ICP-MS	5		U		mg/L	0.0005	0.003	03/12/20 18:41	mfm

#### Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	292			mg/L	2	20	03/04/20 0:00	nmc
Carbonate as CaCO3		1		U		mg/L	2	20	03/04/20 0:00	nmc
Hydroxide as CaCO3		1		U		mg/L	2	20	03/04/20 0:00	nmc
Total Alkalinity		1	292		*	mg/L	2	20	03/04/20 0:00	nmc
Cation-Anion Balance	Calculation									
Cation-Anion Balance			2.4			%			03/26/20 0:00	calc
Sum of Anions			61			meq/L			03/26/20 0:00	calc
Sum of Cations			64			meq/L			03/26/20 0:00	calc
Chloride	SM4500Cl-E	10	519		*	mg/L	5	20	03/16/20 9:30	rbt
Conductivity @25C	SM2510B	1	4870			umhos/cm	1	10	03/06/20 21:03	eep
Cyanide, Total	D7511-09	1		U		mg/L	0.003	0.01	03/04/20 14:35	rbt
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	1		U	*	mg/L	0.02	0.1	03/19/20 0:18	pjb
Residue, Filterable (TDS) @180C	SM2540C	2	4320			mg/L	40	80	03/03/20 18:19	jck
Sulfate	D516-02/-07/-11 - Turbidimetric	120	1910		*	mg/L	120	600	03/12/20 10:55	rbt
TDS (calculated)	Calculation		3800			mg/L			03/26/20 0:00	calc
TDS (ratio - measured/calculated)	Calculation		1.14						03/26/20 0:00	calc

### Report Header Explanations

<b>Batch</b>	A distinct set of samples analyzed at a specific time
<b>Found</b>	Value of the QC Type of interest
<b>Limit</b>	Upper limit for RPD, in %.
<b>Lower</b>	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
<b>MDL</b>	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
<b>PCN/SCN</b>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<b>PQL</b>	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
<b>QC</b>	True Value of the Control Sample or the amount added to the Spike
<b>Rec</b>	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
<b>RPD</b>	Relative Percent Difference, calculation used for Duplicate QC Types
<b>Upper</b>	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
<b>Sample</b>	Value of the Sample of interest

### QC Sample Types

<b>AS</b>	Analytical Spike (Post Digestion)	<b>LCSWD</b>	Laboratory Control Sample - Water Duplicate
<b>ASD</b>	Analytical Spike (Post Digestion) Duplicate	<b>LFB</b>	Laboratory Fortified Blank
<b>CCB</b>	Continuing Calibration Blank	<b>LFM</b>	Laboratory Fortified Matrix
<b>CCV</b>	Continuing Calibration Verification standard	<b>LFMD</b>	Laboratory Fortified Matrix Duplicate
<b>DUP</b>	Sample Duplicate	<b>LRB</b>	Laboratory Reagent Blank
<b>ICB</b>	Initial Calibration Blank	<b>MS</b>	Matrix Spike
<b>ICV</b>	Initial Calibration Verification standard	<b>MSD</b>	Matrix Spike Duplicate
<b>ICSAB</b>	Inter-element Correction Standard - A plus B solutions	<b>PBS</b>	Prep Blank - Soil
<b>LCSS</b>	Laboratory Control Sample - Soil	<b>PBW</b>	Prep Blank - Water
<b>LCSSD</b>	Laboratory Control Sample - Soil Duplicate	<b>PQV</b>	Practical Quantitation Verification standard
<b>LCSW</b>	Laboratory Control Sample - Water	<b>SDL</b>	Serial Dilution

### QC Sample Type Explanations

<b>Blanks</b>	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
<b>Control Samples</b>	Verifies the accuracy of the method, including the prep procedure.
<b>Duplicates</b>	Verifies the precision of the instrument and/or method.
<b>Spikes/Fortified Matrix</b>	Determines sample matrix interferences, if any.
<b>Standard</b>	Verifies the validity of the calibration.

### ACZ Qualifiers (Qual)

<b>B</b>	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
<b>H</b>	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
<b>L</b>	Target analyte response was below the laboratory defined negative threshold.
<b>U</b>	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

### Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

### Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<https://aczel.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf>

Rio Algom Mining Company

ACZ Project ID: L57691

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

**Alkalinity as CaCO3**

SM2320B - Titration

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG492912</b>													
WG492912PBW1	PBW	03/03/20 17:44				U	mg/L		-20	20			
WG492912LCSW3	LCSW	03/03/20 18:04	WC200221-10	820.0001		850	mg/L	104	90	110			
WG492912LCSW6	LCSW	03/03/20 21:29	WC200221-10	820.0001		852	mg/L	104	90	110			
WG492912PBW2	PBW	03/03/20 21:38				U	mg/L		-20	20			
WG492912LCSW9	LCSW	03/04/20 2:05	WC200221-10	820.0001		860	mg/L	105	90	110			
WG492912PBW3	PBW	03/04/20 2:13				U	mg/L		-20	20			
WG492912LCSW12	LCSW	03/04/20 6:39	WC200221-10	820.0001		870	mg/L	106	90	110			
WG492912PBW4	PBW	03/04/20 6:48				U	mg/L		-20	20			
L57691-02DUP	DUP	03/04/20 8:39			1140	1160	mg/L				2	20	
L57691-04DUP	DUP	03/04/20 10:10			U	U	mg/L				0	20	RA
WG492912LCSW15	LCSW	03/04/20 10:30	WC200221-10	820.0001		866	mg/L	106	90	110			

**Antimony, dissolved**

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493477</b>													
WG493477ICV	ICV	03/12/20 18:05	MS200210-2	.02004		.02006	mg/L	100	90	110			
WG493477ICB	ICB	03/12/20 18:07				.00043	mg/L		-0.00088	0.00088			
WG493477LFB	LFB	03/12/20 18:09	MS200120-3	.01		.0089	mg/L	89	85	115			
L57781-01AS	AS	03/12/20 18:52	MS200120-3	.01	.0006	.00972	mg/L	91	70	130			
L57781-01ASD	ASD	03/12/20 18:54	MS200120-3	.01	.0006	.00989	mg/L	93	70	130	2	20	

**Arsenic, dissolved**

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493477</b>													
WG493477ICV	ICV	03/12/20 18:05	MS200210-2	.05		.05	mg/L	100	90	110			
WG493477ICB	ICB	03/12/20 18:07				U	mg/L		-0.00044	0.00044			
WG493477LFB	LFB	03/12/20 18:09	MS200120-3	.05005		.05014	mg/L	100	85	115			
L57781-01AS	AS	03/12/20 18:52	MS200120-3	.05005	.0002	.05482	mg/L	109	70	130			
L57781-01ASD	ASD	03/12/20 18:54	MS200120-3	.05005	.0002	.05431	mg/L	108	70	130	1	20	

**Barium, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493455</b>													
WG493455ICV	ICV	03/17/20 22:53	II200317-1	2		1.929	mg/L	96	95	105			
WG493455ICB	ICB	03/17/20 22:59				U	mg/L		-0.021	0.021			
WG493455LFB	LFB	03/17/20 23:12	II200302-4	.5005		.4927	mg/L	98	85	115			
L57691-05AS	AS	03/17/20 23:35	II200302-4	.5005	.014	.514	mg/L	100	85	115			
L57691-05ASD	ASD	03/17/20 23:38	II200302-4	.5005	.014	.5104	mg/L	99	85	115	1	20	

**Beryllium, dissolved**

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493477</b>													
WG493477ICV	ICV	03/12/20 18:05	MS200210-2	.05		.049514	mg/L	99	90	110			
WG493477ICB	ICB	03/12/20 18:07				U	mg/L		-0.000176	0.000176			
WG493477LFB	LFB	03/12/20 18:09	MS200120-3	.05005		.047711	mg/L	95	85	115			
L57781-01AS	AS	03/12/20 18:52	MS200120-3	.05005	U	.046236	mg/L	92	70	130			
L57781-01ASD	ASD	03/12/20 18:54	MS200120-3	.05005	U	.045868	mg/L	92	70	130	1	20	

Rio Algom Mining Company

ACZ Project ID: L57691

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

**Cadmium, dissolved** M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493477</b>													
WG493477ICV	ICV	03/12/20 18:05	MS200210-2	.05		.050356	mg/L	101	90	110			
WG493477ICB	ICB	03/12/20 18:07				U	mg/L		-0.00011	0.00011			
WG493477LFB	LFB	03/12/20 18:09	MS200120-3	.05005		.048004	mg/L	96	85	115			
L57781-01AS	AS	03/12/20 18:52	MS200120-3	.05005	U	.049396	mg/L	99	70	130			
L57781-01ASD	ASD	03/12/20 18:54	MS200120-3	.05005	U	.049522	mg/L	99	70	130	0	20	

**Calcium, dissolved** M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493455</b>													
WG493455ICV	ICV	03/17/20 22:53	II200317-1	100		95.54	mg/L	96	95	105			
WG493455ICB	ICB	03/17/20 22:59				U	mg/L		-0.3	0.3			
WG493455LFB	LFB	03/17/20 23:12	II200302-4	68.00334		69.33	mg/L	102	85	115			
L57691-05AS	AS	03/17/20 23:35	II200302-4	68.00334	77.8	144.1	mg/L	97	85	115			
L57691-05ASD	ASD	03/17/20 23:38	II200302-4	68.00334	77.8	143	mg/L	96	85	115	1	20	

**Chloride** SM4500Cl-E

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493580</b>													
WG493580ICB	ICB	03/16/20 8:32				U	mg/L		-1.5	1.5			
WG493580ICV	ICV	03/16/20 8:32	WI190501-1	54.835		56.16	mg/L	102	90	110			
WG493580LFB1	LFB	03/16/20 8:55	WI190812-3	30		32.28	mg/L	108	90	110			
L57664-01AS	AS	03/16/20 9:08	WI190812-3	30	17.7	49.08	mg/L	105	90	110			
L57664-02DUP	DUP	03/16/20 9:08			60	59.64	mg/L				1	20	
WG493580LFB2	LFB	03/16/20 9:09	WI190812-3	30		32.66	mg/L	109	90	110			
L57694-03DUP	DUP	03/16/20 9:20			13.7	13.25	mg/L				3	20	
L57694-02AS	AS	03/16/20 9:30	10XCL	30	298	321.9	mg/L	80	90	110			M3

**Conductivity @25C** SM2510B

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493158</b>													
WG493158LCSW2	LCSW	03/06/20 18:15	PCN60029	1410		1430	umhos/cm	101	90	110			
L57691-07DUP	DUP	03/06/20 21:14			4870	4870	umhos/cm				0	20	
WG493158LCSW5	LCSW	03/06/20 21:21	PCN60029	1410		1420	umhos/cm	101	90	110			
WG493158LCSW8	LCSW	03/07/20 1:10	PCN60029	1410		1420	umhos/cm	101	90	110			
WG493158LCSW11	LCSW	03/07/20 5:09	PCN60029	1410		1420	umhos/cm	101	90	110			
WG493158LCSW14	LCSW	03/07/20 8:37	PCN60029	1410		1410	umhos/cm	100	90	110			

**Cyanide, Total** D7511-09

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG492958</b>													
WG492958ICV	ICV	03/04/20 13:59	WI200301-5	.3		.2784	mg/L	93	90	110			
WG492958ICB	ICB	03/04/20 14:01				U	mg/L		-0.003	0.003			
WG492958LFB	LFB	03/04/20 14:07	WI200301-6	.1		.0974	mg/L	97	84	116			
L57682-04AS	AS	03/04/20 14:11	WI200301-6	.1	U	.0973	mg/L	97	84	116			
L57682-04ASD	ASD	03/04/20 14:13	WI200301-6	.1	U	.0986	mg/L	99	84	116	1	20	



Rio Algom Mining Company

ACZ Project ID: L57691

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

**Iron, dissolved** M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493777</b>													
WG493777ICV	ICV	03/18/20 10:41	II200318-2	2		1.903	mg/L	95	95	105			
WG493777ICB	ICB	03/18/20 10:47				U	mg/L		-0.09	0.09			
WG493777LFB	LFB	03/18/20 11:00	II200302-4	1.0018		.983	mg/L	98	85	115			
L57691-05AS	AS	03/18/20 11:21	II200302-4	1.0018	.03	1.088	mg/L	106	85	115			
L57691-05ASD	ASD	03/18/20 11:24	II200302-4	1.0018	.03	1.022	mg/L	99	85	115	6	20	

**Lead, dissolved** M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493477</b>													
WG493477ICV	ICV	03/12/20 18:05	MS200210-2	.05		.05215	mg/L	104	90	110			
WG493477ICB	ICB	03/12/20 18:07				U	mg/L		-0.00022	0.00022			
WG493477LFB	LFB	03/12/20 18:09	MS200120-3	.05005		.04851	mg/L	97	85	115			
L57781-01AS	AS	03/12/20 18:52	MS200120-3	.05005	.0004	.05111	mg/L	101	70	130			
L57781-01ASD	ASD	03/12/20 18:54	MS200120-3	.05005	.0004	.05065	mg/L	100	70	130	1	20	

**Magnesium, dissolved** M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493455</b>													
WG493455ICV	ICV	03/17/20 22:53	II200317-1	100		95.82	mg/L	96	95	105			
WG493455ICB	ICB	03/17/20 22:59				U	mg/L		-0.6	0.6			
WG493455LFB	LFB	03/17/20 23:12	II200302-4	49.99771		50.29	mg/L	101	85	115			
L57691-05AS	AS	03/17/20 23:35	II200302-4	49.99771	41.7	90.81	mg/L	98	85	115			
L57691-05ASD	ASD	03/17/20 23:38	II200302-4	49.99771	41.7	90.2	mg/L	97	85	115	1	20	

**Molybdenum, dissolved** M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493477</b>													
WG493477ICV	ICV	03/12/20 18:05	MS200210-2	.0199		.02021	mg/L	102	90	110			
WG493477ICB	ICB	03/12/20 18:07				U	mg/L		-0.00044	0.00044			
WG493477LFB	LFB	03/12/20 18:09	MS200120-3	.0501		.04734	mg/L	94	85	115			
L57683-03AS	AS	03/12/20 18:16	MS200120-3	.0501	.27	.32246	mg/L	105	70	130			
L57683-03ASD	ASD	03/12/20 18:18	MS200120-3	.0501	.27	.32108	mg/L	102	70	130	0	20	
L57781-01AS	AS	03/12/20 18:52	MS200120-3	.0501	.0032	.05303	mg/L	99	70	130			
L57781-01ASD	ASD	03/12/20 18:54	MS200120-3	.0501	.0032	.05339	mg/L	100	70	130	1	20	

**Nickel, dissolved** M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493477</b>													
WG493477ICV	ICV	03/12/20 18:05	MS200210-2	.05		.05179	mg/L	104	90	110			
WG493477ICB	ICB	03/12/20 18:07				U	mg/L		-0.00088	0.00088			
WG493477LFB	LFB	03/12/20 18:09	MS200120-3	.05		.0501	mg/L	100	85	115			
L57683-03AS	AS	03/12/20 18:16	MS200120-3	.05	.0017	.04658	mg/L	90	70	130			
L57683-03ASD	ASD	03/12/20 18:18	MS200120-3	.05	.0017	.04724	mg/L	91	70	130	1	20	
L57781-01AS	AS	03/12/20 18:52	MS200120-3	.05	.0035	.05038	mg/L	94	70	130			
L57781-01ASD	ASD	03/12/20 18:54	MS200120-3	.05	.0035	.0501	mg/L	93	70	130	1	20	

Rio Algom Mining Company

ACZ Project ID: L57691

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

**Nitrate/Nitrite as N**

M353.2 - H2SO4 preserved

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493853</b>													
WG493853ICV	ICV	03/18/20 22:13	WI200213-7	2.416		2.509	mg/L	104	90	110			
WG493853ICB	ICB	03/18/20 22:14				U	mg/L		-0.02	0.02			
<b>WG493856</b>													
WG493856LFB1	LFB	03/18/20 23:36	WI191004-3	2		2.039	mg/L	102	90	110			
L57665-02AS	AS	03/18/20 23:58	WI191004-3	2	1.39	3.437	mg/L	102	90	110			
L57683-01DUP	DUP	03/19/20 0:01			U	U	mg/L				0	20	RA
WG493856LFB2	LFB	03/19/20 0:16	WI191004-3	2		2.031	mg/L	102	90	110			
L57691-07DUP	DUP	03/19/20 0:19			U	.021	mg/L				200	20	RA
L57691-07AS	AS	03/19/20 0:20	WI191004-3	2	U	2.174	mg/L	109	90	110			

**Potassium, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493455</b>													
WG493455ICV	ICV	03/17/20 22:53	II200317-1	20		19.2	mg/L	96	95	105			
WG493455ICB	ICB	03/17/20 22:59				U	mg/L		-0.6	0.6			
WG493455LFB	LFB	03/17/20 23:12	II200302-4	99.95798		101.1	mg/L	101	85	115			
L57691-05AS	AS	03/17/20 23:35	II200302-4	99.95798	6.6	108.6	mg/L	102	85	115			
L57691-05ASD	ASD	03/17/20 23:38	II200302-4	99.95798	6.6	108.3	mg/L	102	85	115	0	20	

**Residue, Filterable (TDS) @180C**

SM2540C

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG492816</b>													
WG492816PBW	PBW	03/02/20 18:10				U	mg/L		-20	20			
WG492816LCSW	LCSW	03/02/20 18:12	PCN60398	1000		1000	mg/L	100	80	120			
L57691-05DUP	DUP	03/02/20 19:10			1220	1220	mg/L				0	10	
<b>WG492914</b>													
WG492914PBW	PBW	03/03/20 17:25				U	mg/L		-20	20			
WG492914LCSW	LCSW	03/03/20 17:27	PCN60398	1000		996	mg/L	100	80	120			
L57691-07DUP	DUP	03/03/20 18:22			4320	4310	mg/L				0	10	

**Selenium, dissolved**

SM 3114 B, AA-Hydride

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493050</b>													
WG493050ICV	ICV	03/06/20 13:58	SE200103-2	.025025		.0265	mg/L	106	90	110			
WG493050ICB	ICB	03/06/20 14:00				U	mg/L		-0.003	0.003			
WG493050LRB	LRB	03/06/20 14:03				U	mg/L		-0.003	0.003			
WG493050LFB	LFB	03/06/20 14:05	SE200103-4	.02224		.0237	mg/L	107	85	115			
L57682-03LFM	LFM	03/06/20 14:38	SE200103-4	.02224	U	.022	mg/L	99	85	115			
L57682-03LFMD	LFMD	03/06/20 14:40	SE200103-4	.02224	U	.0225	mg/L	101	85	115	2	20	

Rio Algom Mining Company

ACZ Project ID: L57691

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

**Sodium, dissolved** M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493455</b>													
WG493455ICV	ICV	03/17/20 22:53	II200317-1	100		96.38	mg/L	96	95	105			
WG493455ICB	ICB	03/17/20 22:59				U	mg/L		-0.6	0.6			
WG493455LFB	LFB	03/17/20 23:12	II200302-4	100.0046		100.2	mg/L	100	85	115			
L57691-05AS	AS	03/17/20 23:35	II200302-4	100.0046	227	319.3	mg/L	92	85	115			
L57691-05ASD	ASD	03/17/20 23:38	II200302-4	100.0046	227	316.7	mg/L	90	85	115	1	20	

**Sulfate** D516-02/-07/-11 - Turbidimetric

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493429</b>													
WG493429ICB	ICB	03/12/20 9:15				U	mg/L		-3	3			
WG493429ICV	ICV	03/12/20 9:15	WI200305-2	20		19.2	mg/L	96	90	110			
WG493429LFB	LFB	03/12/20 9:57	WI190801-3	10.01		9	mg/L	90	90	110			
L52842-37AS	AS	03/12/20 9:57	WI190801-3	10.01	U	9.6	mg/L	96	90	110			
L52843-37DUP	DUP	03/12/20 10:04			92.6	90.9	mg/L				2	20	
L57691-05DUP	DUP	03/12/20 10:44			753	749	mg/L				1	20	
L57691-04AS	AS	03/12/20 10:55	SO4TURB	10.0000008	2800	2870	mg/L	700	90	110			M3

**Uranium, dissolved** M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG493477</b>													
WG493477ICV	ICV	03/12/20 18:05	MS200210-2	.05		.05232	mg/L	105	90	110			
WG493477ICB	ICB	03/12/20 18:07				U	mg/L		-0.00022	0.00022			
WG493477LFB	LFB	03/12/20 18:09	MS200120-3	.05		.0487	mg/L	97	85	115			
L57683-03AS	AS	03/12/20 18:16	MS200120-3	.05	U	.05259	mg/L	105	70	130			
L57683-03ASD	ASD	03/12/20 18:18	MS200120-3	.05	U	.053	mg/L	106	70	130	1	20	
L57781-01AS	AS	03/12/20 18:52	MS200120-3	.05	.0008	.05426	mg/L	107	70	130			
L57781-01ASD	ASD	03/12/20 18:54	MS200120-3	.05	.0008	.05383	mg/L	106	70	130	1	20	

Rio Algom Mining Company

ACZ Project ID: L57691

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L57691-01	WG492958	Cyanide, Total	D7511-09	Q3	Sample received with improper or inadequate chemical preservation.
	WG493856	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
L57691-02	WG493580	Chloride	SM4500Cl-E	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG492958	Cyanide, Total	D7511-09	Q3	Sample received with improper or inadequate chemical preservation.
	WG493856	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
L57691-03	WG493580	Chloride	SM4500Cl-E	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG493856	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG493429	Sulfate	D516-02/-07/-11 - Turbidimetric	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG492912	Total Alkalinity	SM2320B - Titration	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
L57691-04	WG493580	Chloride	SM4500Cl-E	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG493856	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG493429	Sulfate	D516-02/-07/-11 - Turbidimetric	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG492912	Total Alkalinity	SM2320B - Titration	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
L57691-05	WG493580	Chloride	SM4500Cl-E	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG493856	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG493429	Sulfate	D516-02/-07/-11 - Turbidimetric	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG492912	Total Alkalinity	SM2320B - Titration	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).

Rio Algom Mining Company

ACZ Project ID: **L57691**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L57691-06	WG493580	Chloride	SM4500Cl-E	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG493856	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG493429	Sulfate	D516-02/07/11 - Turbidimetric	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG492912	Total Alkalinity	SM2320B - Titration	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
L57691-07	WG493580	Chloride	SM4500Cl-E	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG493856	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).
	WG493429	Sulfate	D516-02/07/11 - Turbidimetric	M3	The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The recovery of the associated control sample (LCS or LFB) was acceptable.
	WG492912	Total Alkalinity	SM2320B - Titration	RA	Relative Percent Difference (RPD) was not used for data validation because the concentration of the duplicated sample is too low for accurate evaluation (< 10x MDL).

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 31-02 TRB

Locator:

ACZ Sample ID: L57691-01

Date Sampled: 02/25/20 10:20

Date Received: 02/29/20

Sample Matrix: Groundwater

Gross Alpha - Corrected  
Calculation

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha - Corrected	03/26/20 7:38		4.7			pCi/L		calc

Gross Alpha, dissolved  
M9310

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha, dissolved	03/12/20 0:04		7.4	21	85	pCi/L		isn

Lead 210, dissolved  
EICHROM, OTW01

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Lead 210, dissolved	03/13/20 9:03		-1.6	3	7.4	pCi/L	*	jlg

Radium 226, dissolved  
M903.1

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226, dissolved	03/16/20 0:27		3.8	0.23	0.06	pCi/L		jlg

Radium 228, dissolved  
M9320

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228, dissolved	03/12/20 18:01		13	1.4	2.3	pCi/L	*	amk

Thorium 230, dissolved  
ESM 4506

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Thorium 230, dissolved	03/25/20 7:55		0.362	0.27	0.36	pCi/L	*	djc

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 13-20 TRB

Locator:

ACZ Sample ID: **L57691-02**

Date Sampled: 02/25/20 9:20

Date Received: 02/29/20

Sample Matrix: Groundwater

Gross Alpha - Corrected

Prep Method:

Calculation

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha - Corrected	03/26/20 7:38		-2.6			pCi/L		calc

Gross Alpha, dissolved

Prep Method:

M9310

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha, dissolved	03/12/20 0:05		0.0	18	70	pCi/L		isn

Lead 210, dissolved

Prep Method:

EICHROM, OTW01

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Lead 210, dissolved	03/13/20 11:30		-1.5	1.4	3.3	pCi/L	*	jlg

Radium 226, dissolved

Prep Method:

M903.1

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226, dissolved	03/16/20 0:28		4.6	0.28	0.12	pCi/L	*	jlg

Radium 228, dissolved

Prep Method:

M9320

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228, dissolved	03/12/20 18:01		13	1.3	1.9	pCi/L	*	amk

Thorium 230, dissolved

Prep Method:

ESM 4506

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Thorium 230, dissolved	03/19/20 7:13		0.396	0.28	0.37	pCi/L	*	djc

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 31-01 TRA

Locator:

ACZ Sample ID: **L57691-03**

Date Sampled: 02/25/20 11:47

Date Received: 02/29/20

Sample Matrix: Groundwater

Gross Alpha - Corrected  
Calculation

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha - Corrected	03/26/20 7:38		4.3			pCi/L		calc

Gross Alpha, dissolved  
M9310

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha, dissolved	03/12/20 0:07		4.6	4.9	25	pCi/L		isn

Lead 210, dissolved  
EICHROM, OTW01

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Lead 210, dissolved	03/13/20 11:30		-0.35	2.8	6.7	pCi/L	*	jlg

Radium 226, dissolved  
M903.1

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226, dissolved	03/16/20 0:30		0.26	0.1	0.16	pCi/L		jlg

Radium 228, dissolved  
M9320

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228, dissolved	03/15/20 13:41		1.3	0.98	2.2	pCi/L		isn

Thorium 230, dissolved  
ESM 4506

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Thorium 230, dissolved	03/18/20 15:52		0.46	0.48	0.78	pCi/L	*	djc



**Rio Algom Mining Company**

Project ID: 4508122295  
 Sample ID: 36-06 KD  
 Locator:

ACZ Sample ID: **L57691-04**  
 Date Sampled: 02/25/20 14:07  
 Date Received: 02/29/20  
 Sample Matrix: Groundwater

Gross Alpha - Corrected  
 Calculation

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha - Corrected	03/26/20 7:38		54			pCi/L		calc

Gross Alpha, dissolved  
 M9310

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha, dissolved	03/12/20 0:08		350	57	46	pCi/L		isn

Lead 210, dissolved  
 EICHROM, OTW01

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Lead 210, dissolved	03/13/20 11:30		-1.3	2.9	7	pCi/L	*	jljg

Radium 226, dissolved  
 M903.1

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226, dissolved	03/19/20 0:07		16	0.54	0.2	pCi/L		jljg

Radium 228, dissolved  
 M9320

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228, dissolved	03/15/20 13:41		8	1.1	1.9	pCi/L		isn

Thorium 230, dissolved  
 ESM 4506

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Thorium 230, dissolved	03/18/20 15:52		9.07	1.7	0.7	pCi/L	*	djc

**Rio Algom Mining Company**

Project ID: 4508122295  
 Sample ID: 17-01 KD  
 Locator:

ACZ Sample ID: **L57691-05**  
 Date Sampled: 02/27/20 9:21  
 Date Received: 02/29/20  
 Sample Matrix: Groundwater

Gross Alpha - Corrected  
 Calculation

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha - Corrected	03/26/20 7:38		2.3			pCi/L		calc

Gross Alpha, dissolved  
 M9310

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha, dissolved	03/12/20 0:10		2.3	3.1	11	pCi/L		isn

Lead 210, dissolved  
 EICHROM, OTW01

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Lead 210, dissolved	03/13/20 11:30		-2.2	1.2	3	pCi/L	*	jlj

Radium 226, dissolved  
 M903.1

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226, dissolved	03/19/20 0:08		0.86	0.15	0.17	pCi/L		jlj

Radium 228, dissolved  
 M9320

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228, dissolved	03/15/20 13:41		0.44	0.87	2.1	pCi/L		isn

Thorium 230, dissolved  
 ESM 4506

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Thorium 230, dissolved	03/18/20 15:52		0.126	0.3	0.54	pCi/L	*	djc

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 32-45 KD-R

Locator:

ACZ Sample ID: **L57691-06**

Date Sampled: 02/27/20 11:11

Date Received: 02/29/20

Sample Matrix: Groundwater

Gross Alpha - Corrected  
 Calculation

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha - Corrected	03/26/20 7:38		87			pCi/L		calc

Gross Alpha, dissolved  
 M9310

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha, dissolved	03/12/20 0:11		120	16	14	pCi/L		isn

Lead 210, dissolved  
 EICHROM, OTW01

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Lead 210, dissolved	03/13/20 11:30		-2.1	1.1	2.9	pCi/L	*	jljg

Radium 226, dissolved  
 M903.1

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226, dissolved	03/19/20 0:10		0.96	0.12	0.05	pCi/L		jljg

Radium 228, dissolved  
 M9320

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228, dissolved	03/15/20 13:41		1.6	0.91	2.1	pCi/L		isn

Thorium 230, dissolved  
 ESM 4506

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Thorium 230, dissolved	03/18/20 15:52		0.786	0.33	0.09	pCi/L	*	djc

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 30-48 KD-R

Locator:

ACZ Sample ID: **L57691-07**

Date Sampled: 02/27/20 12:16

Date Received: 02/29/20

Sample Matrix: Groundwater

Gross Alpha - Corrected  
Calculation

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha - Corrected	03/26/20 7:38		-2.1			pCi/L		calc

Gross Alpha, dissolved  
M9310

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha, dissolved	03/12/20 0:12		-2.1	7.7	95	pCi/L		isn

Lead 210, dissolved  
EICHROM, OTW01

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Lead 210, dissolved	03/13/20 11:30		-0.56	1.2	2.9	pCi/L	*	jlg

Radium 226, dissolved  
M903.1

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226, dissolved	03/19/20 0:11		2.1	0.16	0.07	pCi/L		jlg

Radium 228, dissolved  
M9320

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228, dissolved	03/15/20 13:41		7	1.1	2.2	pCi/L		isn

Thorium 230, dissolved  
ESM 4506

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Thorium 230, dissolved	03/19/20 2:26		0.469	0.3	0.38	pCi/L	*	djc

### Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Error(+/-)</i>	Calculated sample specific uncertainty
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>LCL</i>	Lower Control Limit, in % (except for LCSS, mg/Kg)
<i>LLD</i>	Calculated sample specific Lower Limit of Detection
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec-</i>	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
<i>RER</i>	Relative Error Ratio, calculation used for Dup. QC taking into account the error factor.
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>UCL</i>	Upper Control Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

### QC Sample Types

<i>DUP</i>	Sample Duplicate	<i>MS/MSD</i>	Matrix Spike/Matrix Spike Duplicate
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBS</i>	Prep Blank - Soil
<i>LCSW</i>	Laboratory Control Sample - Water	<i>PBW</i>	Prep Blank - Water

### QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Matrix Spikes	Determines sample matrix interferences, if any.

### ACZ Qualifiers (Qual)

H	Analysis exceeded method hold time.
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### Method Prefix Reference

M	EPA methodology, including those under SDWA, CWA, and RCRA
SM	Standard Methods for the Examination of Water and Wastewater.
D	ASTM
RP	DOE
ESM	DOE/ESM

### Comments

- (1) Solid matrices are reported on a dry weight basis.
- (2) Preparation method: "Method" indicates preparation defined in analytical method.
- (3) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.

For a complete list of ACZ's Extended Qualifiers, please click:

<https://aczk.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf>

Rio Algom Mining Company

ACZ Project ID: L57691

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Gross Alpha, dissolved

M9310

Units: pCi/L

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Error	LLD	Found	Error	LLD	Rec%	Lower	Upper	RPD/RER	Limit	Qual
<b>WG493365</b>																
WG493365PBW	PBW	03/12/20						3.2	1.8	11			22			
WG493365LCSWA	LCSW	03/12/20	PCN60283	100				100	8.6	12	100	67	144			
L57727-01DUP	DUP-RPD	03/12/20			5.9	2.7	5.2	7.2	3	10				20	20	
L57727-02DUP	DUP-RER	03/12/20			9.4	3.3	4.9	6.4	2.8	6.5				0.69	2	
L57727-02DUP	DUP-RPD	03/12/20			9.4	3.3	4.9	6.4	2.8	6.5				38	20	RG
L57727-03MSA	MS	03/12/20	PCN60283	100	9.7	3.4	6	92	9.6	15	82	67	144			

Lead 210, dissolved

EICHROM, OTW01

Units: pCi/L

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Error	LLD	Found	Error	LLD	Rec%	Lower	Upper	RPD/RER	Limit	Qual
<b>WG492938</b>																
WG492938PBW	PBW	03/13/20						-1.5	1.3	3.2			6.4			
L57682-05DUP	DUP-RER	03/13/20			-0.94	1.4	3.4	-1.2	3	7.2				0.08	2	
L57682-05DUP	DUP-RPD	03/13/20			-0.94	1.4	3.4	-1.2	3	7.2				24	20	RG
WG492938LCSW	LCSW	03/13/20	PCN59631	98.22				100	3.3	2.8	102	55	121			
L57691-07DUP	DUP-RPD	03/13/20			-0.56	1.2	2.9	-2.6	2.8	6.9				129	20	RG
L57691-05MS	MS	03/13/20	PCN59631	245.54	-2.2	1.2	3	230	8.2	8.4	95	55	121			
L57691-07DUP	DUP-RER	03/13/20			-0.56	1.2	2.9	-2.6	2.8	6.9				0.67	2	

Rio Algom Mining Company

ACZ Project ID: L57691

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Radium 226, dissolved

M903.1

Units: pCi/L

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Error	LLD	Found	Error	LLD	Rec%	Lower	Upper	RPD/RER	Limit	Qual
<b>WG493067</b>																
WG493067PBW	PBW	03/16/20						.21	0.14	0.13			0.26			
WG493067LCSW	LCSW	03/16/20	PCN57864	20				23	0.71	0.15	115	43	148			
L57636-01MS	MS	03/16/20	PCN57864	20	0.21	0.1	0.07	18	0.54	0.16	89	43	148			
L57616-02DUP1	DUP-RPD	03/16/20			5.3	0.3	0.17	4.8	0.24	0.07				10	20	
L57683-01DUP2	DUP-RPD	03/16/20			0.7	0.13	0.12	.79	0.15	0.14				12	20	
<b>WG493340</b>																
WG493340PBW	PBW	03/19/20						.14	0.09	0.09			0.18			
WG493340LCSW	LCSW	03/19/20	PCN57864	20				20	0.7	0.17	100	43	148			
L57661-01DUP1	DUP-RPD	03/19/20			0.28	0.09	0.13	.34	0.09	0.13				19	20	
L57713-01DUP2	DUP-RPD	03/19/20			4.3	0.27	0.07	3.9	0.23	0.07				10	20	
L57694-04MS	MS	03/19/20	PCN57864	23.53	0.21	0.07	0.08	27	0.65	0.14	114	43	148			

Rio Algom Mining Company

ACZ Project ID: L57691

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Radium 228, dissolved

M9320

Units: pCi/L

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Error	LLD	Found	Error	LLD	Rec%	Lower	Upper	RPD/RER	Limit	Qual
<b>WG493216</b>																
WG493216PBW	PBW	03/12/20						.47	0.36	0.35			0.7			
WG493216LCSW	LCSW	03/12/20	PCN58076	8.68				9	1.2	0.86	104	47	123			
L57661-02MS	MS	03/12/20	PCN58076	8.68	2	0.81	1.9	10	1.1	1.9	92	47	123			
L57636-01DUP	DUP-RER	03/12/20			0.57	0.63	1.6	.07	0.95	2.3				0.44	2	
L57636-01DUP	DUP-RPD	03/12/20			0.57	0.63	1.6	.07	0.95	2.3				156	20	RG
L57683-01DUP	DUP-RER	03/12/20			0.39	0.9	2.2	-.71	1.5	3.6				0.63	2	
L57683-01DUP	DUP-RPD	03/12/20			0.39	0.9	2.2	-.71	1.5	3.6				688	20	RG
<b>WG493334</b>																
L57694-04DUP	DUP-RPD	03/15/20			1.1	0.94	2	1	0.87	2				10	20	
WG493334LCSW	LCSW	03/15/20	PCN58076	8.67				8.2	1.2	0.92	95	47	123			
WG493334PBW	PBW	03/15/20						.72	0.43	0.41			0.82			
L57727-02DUP	DUP-RER	03/15/20			-0.43	0.78	2	0	0.79	2.1				0.39	2	
L57727-04MS	MS	03/15/20	PCN58076	8.67	0.48	0.75	1.8	10	1.2	2	110	47	123			
L57727-02DUP	DUP-RPD	03/15/20			-0.43	0.78	2	0	0.79	2.1				200	20	RG

Thorium 230, dissolved

ESM 4506

Units: pCi/L

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Error	LLD	Found	Error	LLD	Rec%	Lower	Upper	RPD/RER	Limit	Qual
<b>WG494041</b>																
WG494041PBW	PBW	03/18/20						.272	0.26	0.39			0.78			
WG494041LCSW	LCSW	03/18/20	PCN58726	200				249	35	0.45	125	91	126			
L57682-01DUP	DUP-RPD	03/19/20			0.239	0.18	0.08	.653	0.42	0.54				93	20	RG
L57682-01DUP	DUP-RER	03/19/20			0.239	0.18	0.08	.653	0.42	0.54				0.91	2	
L57682-03MS	MS	03/19/20	PCN58726	200	0.521	0.34	0.43	256	36	0.47	128	91	126			M1
L57691-07DUP	DUP-RPD	03/19/20			0.469	0.3	0.38	.218	0.18	0.09				73	20	RG
L57691-07DUP	DUP-RER	03/19/20			0.469	0.3	0.38	.218	0.18	0.09				0.72	2	



Rio Algom Mining Company

ACZ Project ID: L57691

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION	
L57691-01	WG492938	Lead 210, dissolved	EICHROM, OTW01	D1	Sample required dilution due to matrix.	
			EICHROM, OTW01	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.	
	WG493216	Radium 228, dissolved	M9320	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.	
			ESM 4506	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.	
	WG494041	Thorium 230, dissolved	ESM 4506	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.	
L57691-02	WG492938	Lead 210, dissolved	EICHROM, OTW01	Q5	Sample received with inadequate chemical preservation. Additional preservation performed by the laboratory.	
			EICHROM, OTW01	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.	
	WG493067	Radium 226, dissolved	M903.1	Q5	Sample received with inadequate chemical preservation. Additional preservation performed by the laboratory.	
			M9320	Q5	Sample received with inadequate chemical preservation. Additional preservation performed by the laboratory.	
	WG493216	Radium 228, dissolved	M9320	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.	
	WG494041	Thorium 230, dissolved	ESM 4506	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.	
			ESM 4506	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.	
	L57691-03	WG492938	Lead 210, dissolved	EICHROM, OTW01	D1	Sample required dilution due to matrix.
				EICHROM, OTW01	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.
WG494041		Thorium 230, dissolved	ESM 4506	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.	
			ESM 4506	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.	
L57691-04	WG492938	Lead 210, dissolved	EICHROM, OTW01	D1	Sample required dilution due to matrix.	
			EICHROM, OTW01	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.	
	WG494041	Thorium 230, dissolved	ESM 4506	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.	
			ESM 4506	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.	
L57691-05	WG492938	Lead 210, dissolved	EICHROM, OTW01	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.	
	WG494041	Thorium 230, dissolved	ESM 4506	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.	
			ESM 4506	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.	

Rio Algom Mining Company

ACZ Project ID: **L57691**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L57691-06	WG492938	Lead 210, dissolved	EICHROM, OTW01	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.
	WG494041	Thorium 230, dissolved	ESM 4506	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.
			ESM 4506	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.
L57691-07	WG492938	Lead 210, dissolved	EICHROM, OTW01	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.
	WG494041	Thorium 230, dissolved	ESM 4506	M1	Matrix spike recovery was high, the recovery of the associated control sample (LCS or LFB) was acceptable.
			ESM 4506	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.

Rio Algom Mining Company

ACZ Project ID: **L57691**

Radiochemistry

The following parameters are not offered for certification or are not covered by NELAC certificate #ACZ.

Lead 210, dissolved	EICHROM, OTW01
Thorium 230, dissolved	ESM.4506

Rio Algom Mining Company  
 4508122295

ACZ Project ID: L57691  
 Date Received: 02/29/2020 11:48  
 Received By:  
 Date Printed: 3/3/2020

**Receipt Verification**

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?			X
2) Is the Chain of Custody form or other directive shipping papers present?	X		
3) Does this project require special handling procedures such as CLP protocol?		X	
4) Are any samples NRC licensable material?			X
5) If samples are received past hold time, proceed with requested short hold time analyses?	X		
6) Is the Chain of Custody form complete and accurate?	X		
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?		X	

**Samples/Containers**

	YES	NO	NA
8) Are all containers intact and with no leaks?	X		
9) Are all labels on containers and are they intact and legible?	X		
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	X		
11) For preserved bottle types, was the pH checked and within limits? <sup>1</sup> L57691-02 Container B2245913 (GREEN CUBE): Added 10 mls nitric acid to the sub-sample to adjust the pH to the appropriate range.		X	
12) Is there sufficient sample volume to perform all requested work?	X		
13) Is the custody seal intact on all containers?			X
14) Are samples that require zero headspace acceptable?			X
15) Are all sample containers appropriate for analytical requirements?	X		
16) Is there an Hg-1631 trip blank present?			X
17) Is there a VOA trip blank present?			X
18) Were all samples received within hold time?	X		

NA indicates Not Applicable

**Chain of Custody Related Remarks**

**Client Contact Remarks**

**Shipping Containers**

Cooler Id	Temp (°C)	Temp Criteria (°C)	Rad (µR/Hr)	Custody Seal Intact?
5248	8.7	NA	14	Yes
4487	9.5	NA	15	Yes
5255	10.7	NA	15	Yes
6661	4.9	<=6.0	13	Yes
6324	5	<=6.0	15	Yes

Rio Algom Mining Company  
4508122295

ACZ Project ID: L57691  
Date Received: 02/29/2020 11:48  
Received By:  
Date Printed: 3/3/2020

Was ice present in the shipment container(s)?

Yes - Wet ice was present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

<sup>1</sup> The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).



Laboratories, Inc. L57691

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Kent Applegate
Company: Rio Algom Mining LLC
E-mail: Kent.KC.Applegate@bhpbilliton.com

Address: PO Box 218
Grants, NM 87020
Telephone: 1-505-287-8851

Copy of Report to:

Name: See Remarks
Company: INTERA, INC.

E-mail: See Remarks
Telephone: 505-246-1600 x1207

Invoice to:

Name: Kent Applegate
Company: Rio Algom Mining LLC
E-mail: Kent.KC.Applegate@bhpbilliton.com

Address: PO Box 218
Grants, NM 87020
Telephone: 1-505-287-8851

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES [X] NO [ ]

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

Are samples for SDWA Compliance Monitoring? Yes [ ] No [X]

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: DW:1104304 Sampler's Site Information State NM Zip code 87020 Time Zone MST

\*Sampler's Signature: [Signature] I attest to the authenticity and validity of this sample. I understand that intentionally mislabeling the time/date/location or tampering with the sample in anyway, is considered fraud and punishable by State Law.

PROJECT INFORMATION

ANALYSES REQUESTED (attach list or use quote number)

Table with columns: Quote #, PO#, Reporting state, Matrix, # of Containers, and analysis columns (NRC-TAD, NRC-TRA, NRC-KO, etc.). Rows include sample IDs like 31-02TR B, 13-20TR B, etc.

Matrix SW (Surface Water) - GW (Ground Water) - WW (Waste Water) - DW (Drinking Water) - SL (Sludge) - SO (Soil) - OL (Oil) - Other (Specify)

REMARKS

RAML COC#: 20-12. Note different COC's may have different PO's. Shipment of 5 Coolers. Please CC report to: cshort@intera.com, apersico@intera.com, Michaela.Gorospe@bhpbilliton.com, jcarroll@intera.com

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with columns: RELINQUISHED BY, DATE:TIME, RECEIVED BY, DATE:TIME. Includes signatures and dates like 2/24/20 17:30 and 2/24/20 11:48.

FRMAD050.06.14.14

White - Return with sample. Yellow - Retain for your records.

L57691 Chain of Custody

April 27, 2020

Report to:  
Kent Applegate  
Rio Algom Mining Company  
P.O. Box 218  
Grants, NM 87020

Bill to:  
Accounts Payable  
Rio Algom Mining Company  
P.O. Box 218  
Grants, NM 87020

cc: Clark Short, Angela Persico, Michaela Gorospe

Project ID: 4508122295  
ACZ Project ID: L58040

Kent Applegate:

Enclosed are revised analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on March 19, 2020 and originally reported on April 27, 2020. Refer to the case narrative for an explanation of the changes. This project was assigned to ACZ's project number, L58040. Please reference this number in all future inquiries.


All analyses were performed according to ACZ's Quality Assurance Plan. The enclosed results relate only to the samples received under L58040. Each section of this report has been reviewed and approved by the appropriate Laboratory Supervisor, or a qualified substitute.

Except as noted, the test results for the methods and parameters listed on ACZ's current NELAC certificate letter (#ACZ) meet all requirements of NELAC.

This report shall be used or copied only in its entirety. ACZ is not responsible for the consequences arising from the use of a partial report.

All samples and sub-samples associated with this project will be disposed of after May 27, 2020. If the samples are determined to be hazardous, additional charges apply for disposal (typically less than \$10/sample). If you would like the samples to be held longer than ACZ's stated policy or to be returned, please contact your Project Manager or Customer Service Representative for further details and associated costs. ACZ retains analytical reports for five years.

If you have any questions or other needs, please contact your Project Manager.



Scott Habermehl has reviewed  
and approved this report.



**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 31-02 TRB-R

ACZ Sample ID: **L58040-01**

Date Sampled: 03/18/20 11:38

Date Received: 03/19/20

Sample Matrix: Groundwater

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Uranium, dissolved	M200.8 ICP-MS	1	0.0037			mg/L	0.0001	0.0005	03/24/20 13:10	bsu



**Rio Algom Mining Company**

Project ID: 4508122295  
 Sample ID: 32-45 KD-R

ACZ Sample ID: **L58040-02**  
 Date Sampled: 03/18/20 12:28  
 Date Received: 03/19/20  
 Sample Matrix: Groundwater

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Molybdenum, dissolved	M200.8 ICP-MS	1	0.115			mg/L	0.0002	0.0005	03/24/20 13:12	bsu
Uranium, dissolved	M200.8 ICP-MS	1	0.0424			mg/L	0.0001	0.0005	03/24/20 13:12	bsu

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 36-06 KD

ACZ Sample ID: **L58040-03**

Date Sampled: 03/18/20 10:48

Date Received: 03/19/20

Sample Matrix: Groundwater

## Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual XQ	Units	MDL	PQL	Date	Analyst
Cadmium, dissolved	M200.8 ICP-MS	1	0.0057		mg/L	0.00005	0.0003	04/24/20 9:02	mfm
Uranium, dissolved	M200.8 ICP-MS	1	0.426		mg/L	0.0001	0.0005	03/24/20 13:14	bsu

### Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>Lower</i>	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
<i>MDL</i>	Method Detection Limit. Same as Minimum Reporting Limit unless omitted or equal to the PQL (see comment #5). Allows for instrument and annual fluctuations.
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit. Synonymous with the EPA term "minimum level".
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Rec</i>	Recovered amount of the true value or spike added, in % (except for LCSS, mg/Kg)
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>Upper</i>	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

### QC Sample Types

<i>AS</i>	Analytical Spike (Post Digestion)	<i>LCSWD</i>	Laboratory Control Sample - Water Duplicate
<i>ASD</i>	Analytical Spike (Post Digestion) Duplicate	<i>LFB</i>	Laboratory Fortified Blank
<i>CCB</i>	Continuing Calibration Blank	<i>LFM</i>	Laboratory Fortified Matrix
<i>CCV</i>	Continuing Calibration Verification standard	<i>LFMD</i>	Laboratory Fortified Matrix Duplicate
<i>DUP</i>	Sample Duplicate	<i>LRB</i>	Laboratory Reagent Blank
<i>ICB</i>	Initial Calibration Blank	<i>MS</i>	Matrix Spike
<i>ICV</i>	Initial Calibration Verification standard	<i>MSD</i>	Matrix Spike Duplicate
<i>ICSAB</i>	Inter-element Correction Standard - A plus B solutions	<i>PBS</i>	Prep Blank - Soil
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBW</i>	Prep Blank - Water
<i>LCSSD</i>	Laboratory Control Sample - Soil Duplicate	<i>PQV</i>	Practical Quantitation Verification standard
<i>LCSW</i>	Laboratory Control Sample - Water	<i>SDL</i>	Serial Dilution

### QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method or calibration procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.
Standard	Verifies the validity of the calibration.

### ACZ Qualifiers (Qual)

<i>B</i>	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
<i>H</i>	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
<i>L</i>	Target analyte response was below the laboratory defined negative threshold.
<i>U</i>	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit.

### Method References

- (1) EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
- (2) EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
- (3) EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
- (4) EPA SW-846. Test Methods for Evaluating Solid Waste.
- (5) Standard Methods for the Examination of Water and Wastewater.

### Comments

- (1) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (2) Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
- (3) Animal matrices for Inorganic analyses are reported on an "as received" basis.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.
- (5) If the MDL equals the PQL or the MDL column is omitted, the PQL is the reporting limit.

For a complete list of ACZ's Extended Qualifiers, please click:

<https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf>

Rio Algom Mining Company

ACZ Project ID: **L58040**

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

**Cadmium, dissolved** M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG496078</b>													
WG496078ICV	ICV	04/24/20 8:57	MS200331-1	.05		.048015	mg/L	96	90	110			
WG496078ICB	ICB	04/24/20 8:58				U	mg/L		-0.00011	0.00011			
WG496078LFB	LFB	04/24/20 9:00	MS200421-3	.05005		.045804	mg/L	92	85	115			
L58531-04AS	AS	04/24/20 9:09	MS200421-3	.05005	U	.041205	mg/L	82	70	130			
L58531-04ASD	ASD	04/24/20 9:11	MS200421-3	.05005	U	.039868	mg/L	80	70	130	3	20	

**Molybdenum, dissolved** M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG494198</b>													
WG494198ICV	ICV	03/24/20 12:45	MS200210-2	.0199		.01977	mg/L	99	90	110			
WG494198ICB	ICB	03/24/20 12:46				U	mg/L		-0.00044	0.00044			
WG494198LFB	LFB	03/24/20 12:48	MS200120-3	.0501		.0513	mg/L	102	85	115			
L58019-02AS	AS	03/24/20 12:54	MS200120-3	.1002	.0005	.10394	mg/L	103	70	130			
L58019-02ASD	ASD	03/24/20 12:55	MS200120-3	.1002	.0005	.10154	mg/L	101	70	130	2	20	

**Uranium, dissolved** M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG494198</b>													
WG494198ICV	ICV	03/24/20 12:45	MS200210-2	.05		.0523	mg/L	105	90	110			
WG494198ICB	ICB	03/24/20 12:46				U	mg/L		-0.00022	0.00022			
WG494198LFB	LFB	03/24/20 12:48	MS200120-3	.05		.05182	mg/L	104	85	115			
L58019-02AS	AS	03/24/20 12:54	MS200120-3	.1	.0019	.10752	mg/L	106	70	130			
L58019-02ASD	ASD	03/24/20 12:55	MS200120-3	.1	.0019	.10536	mg/L	103	70	130	2	20	

Rio Algom Mining Company

ACZ Project ID: **L58040**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
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No extended qualifiers associated with this analysis

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 31-02 TRB-R

Locator:

ACZ Sample ID: **L58040-01**

Date Sampled: 03/18/20 11:38

Date Received: 03/19/20

Sample Matrix: *Groundwater*

Gross Alpha - Corrected

Prep Method:

Calculation

Parameter	Measure Date	Prep Date	Result	Error(%)	LLD	Units	XQ	Analyst
Gross Alpha - Corrected	04/07/20 12:40		4.0			pCi/L		calc

Gross Alpha, dissolved

Prep Method:

M900.0

Parameter	Measure Date	Prep Date	Result	Error(%)	LLD	Units	XQ	Analyst
Gross Alpha, dissolved	04/05/20 0:33		6.5	16	130	pCi/L	*	isn

### Rio Algom Mining Company

Project ID: 4508122295

Sample ID: 32-45 KD-R

Locator:

ACZ Sample ID: **L58040-02**

Date Sampled: 03/18/20 12:28

Date Received: 03/19/20

Sample Matrix: Groundwater

Gross Alpha - Corrected

Prep Method:

Calculation

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha - Corrected	04/07/20 12:40		92			pCi/L		calc

Gross Alpha, dissolved

Prep Method:

M900.0

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha, dissolved	04/05/20 0:34		120	16	12	pCi/L	*	isn

### Rio Algom Mining Company

Project ID: 4508122295

Sample ID: 36-06 KD

Locator:

ACZ Sample ID: **L58040-03**

Date Sampled: 03/18/20 10:48

Date Received: 03/19/20

Sample Matrix: Groundwater

Gross Alpha - Corrected

Prep Method:

Calculation

Parameter	Measure Date	Prep Date	Result	Error(%)	LLD	Units	XQ	Analyst
Gross Alpha - Corrected	04/07/20 12:40		100			pCi/L		calc

Gross Alpha, dissolved

Prep Method:

M900.0

Parameter	Measure Date	Prep Date	Result	Error(%)	LLD	Units	XQ	Analyst
Gross Alpha, dissolved	04/05/20 0:36		390	58	56	pCi/L	*	isn



### Report Header Explanations

<i>Batch</i>	A distinct set of samples analyzed at a specific time
<i>Error(+/-)</i>	Calculated sample specific uncertainty
<i>Found</i>	Value of the QC Type of interest
<i>Limit</i>	Upper limit for RPD, in %.
<i>LCL</i>	Lower Control Limit, in % (except for LCSS, mg/Kg)
<i>LLD</i>	Calculated sample specific Lower Limit of Detection
<i>PCN/SCN</i>	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
<i>PQL</i>	Practical Quantitation Limit
<i>QC</i>	True Value of the Control Sample or the amount added to the Spike
<i>Réc</i>	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
<i>RER</i>	Relative Error Ratio, calculation used for Dup. QC taking into account the error factor.
<i>RPD</i>	Relative Percent Difference, calculation used for Duplicate QC Types
<i>UCL</i>	Upper Control Limit, in % (except for LCSS, mg/Kg)
<i>Sample</i>	Value of the Sample of interest

### QC Sample Types

<i>DUP</i>	Sample Duplicate	<i>MS/MSD</i>	Matrix Spike/Matrix Spike Duplicate
<i>LCSS</i>	Laboratory Control Sample - Soil	<i>PBS</i>	Prep Blank - Soil
<i>LCSW</i>	Laboratory Control Sample - Water	<i>PBW</i>	Prep Blank - Water

### QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Matrix Spikes	Determines sample matrix interferences, if any.

### ACZ Qualifiers (Qual)

H	Analysis exceeded method hold time.
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### Method Prefix Reference

M	EPA methodology, including those under SDWA, CWA, and RCRA
SM	Standard Methods for the Examination of Water and Wastewater.
D	ASTM
RP	DOE
ESM	DOE/ESM

### Comments

- (1) Solid matrices are reported on a dry weight basis.
- (2) Preparation method: "Method" indicates preparation defined in analytical method.
- (3) QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
- (4) An asterisk in the "XQ" column indicates there is an extended qualifier and/or certification qualifier associated with the result.

For a complete list of ACZ's Extended Qualifiers, please click:

<https://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf>

Rio Algom Mining Company

ACZ Project ID: L58040

NOTE: If the Rec% column is null, the high/low limits are in the same units as the result. If the Rec% column is not null, then the high/low limits are in % Rec.

Gross Alpha, dissolved

M900.0

Units: pCi/L

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Error	LLD	Found	Error	LLD	Rec%	Lower	Upper	RPD/RER	Limit	Qual
<b>WG494568</b>																
WG494568PBW	PBW	04/05/20						.66	0.73	0.76			1.52			
WG494568LCSWA	LCSW	04/05/20	PCN60283	100				120	9.1	1.1	120	67	144			
L57872-01DUP	DUP-RPD	04/05/20			2.9	1.8	4.5	2.7	1.8	5.9				7	20	
L57986-01DUP	DUP-RPD	04/05/20			1.5	1.7	7.3	.7	1.5	6.9				73	20	RG
L57986-01DUP	DUP-RER	04/05/20			1.5	1.7	7.3	.7	1.5	6.9				0.35	2	
L58001-01MSA	MS	04/05/20	PCN60283	100	11	3.6	16	100	11	18	89	67	144			

Rio Algom Mining Company

ACZ Project ID: **L58040**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L58040-01	WG494568	Gross Alpha, dissolved	M900.0	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.
L58040-02	WG494568	Gross Alpha, dissolved	M900.0	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.
L58040-03	WG494568	Gross Alpha, dissolved	M900.0	RG	Sample concentration is less than 5x LLD; RPD was not used for data validation. Replicate Error Ratio (RER) is less than 2. Precision judged to be in control.

Rio Algom Mining Company

ACZ Project ID: **L58040**

No certification qualifiers associated with this analysis

Rio Algom Mining Company  
 4508122295

ACZ Project ID: L58040  
 Date Received: 03/19/2020 09:18  
 Received By:  
 Date Printed: 3/20/2020

**Receipt Verification**

	YES	NO	NA
1) Is a foreign soil permit included for applicable samples?			X
2) Is the Chain of Custody form or other directive shipping papers present?	X		
3) Does this project require special handling procedures such as CLP protocol?		X	
4) Are any samples NRC licensable material?			X
5) If samples are received past hold time, proceed with requested short hold time analyses?	X		
6) Is the Chain of Custody form complete and accurate?	X		
7) Were any changes made to the Chain of Custody form prior to ACZ receiving the samples?		X	

**Samples/Containers**

	YES	NO	NA
8) Are all containers intact and with no leaks?	X		
9) Are all labels on containers and are they intact and legible?	X		
10) Do the sample labels and Chain of Custody form match for Sample ID, Date, and Time?	X		
11) For preserved bottle types, was the pH checked and within limits? <sup>1</sup>	X		
12) Is there sufficient sample volume to perform all requested work?	X		
13) Is the custody seal intact on all containers?			X
14) Are samples that require zero headspace acceptable?			X
15) Are all sample containers appropriate for analytical requirements?	X		
16) Is there an Hg-1631 trip blank present?			X
17) Is there a VOA trip blank present?			X
18) Were all samples received within hold time?	X		

NA indicates Not Applicable

**Chain of Custody-Related Remarks**

**Client Contact Remarks**

**Shipping Containers**

Cooler Id	Temp (°C)	Temp Criteria (°C)	Rad (µR/Hr)	Custody Seal Intact?
4926	4.8	NA	14	Yes

Was ice present in the shipment container(s)?

Yes - Wet ice was present in the shipment container(s).

Client must contact an ACZ Project Manager if analysis should not proceed for samples received outside of their thermal preservation acceptance criteria.

Rio Algom Mining Company  
4508122295

ACZ Project ID: L58040

Date Received: 03/19/2020 09:18

Received By:

Date Printed: 3/20/2020

<sup>1</sup> The preservation of the following bottle types is not checked at sample receipt: Orange (oil and grease), Purple (total cyanide), Pink (dissolved cyanide), Brown (arsenic speciation), Sterile (fecal coliform), EDTA (sulfite), HCl preserved vial (organics), Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> preserved vial (organics), and HG-1631 (total/dissolved mercury by method 1631).



Laboratories, Inc. L 58040

CHAIN of CUSTODY

2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Report to:

Name: Kent Applegate
Company: Rio Algom Mining LLC
E-mail: Kent.KC.Applegate@bhpbilliton.com

Address: PO Box 218
Grants, NM 87020
Telephone: 1-505-287-8851

Copy of Report to:

Name: See Remarks
Company: INTERA, INC.

E-mail: See Remarks
Telephone: 505-246-1600 x1207

Invoice to:

Name: Kent Applegate
Company: Rio Algom Mining LLC
E-mail: Kent.KC.Applegate@bhpbilliton.com

Address: PO Box 218
Grants, NM 87020
Telephone: 1-505-287-8851

If sample(s) received past holding time (HT), or if insufficient HT remains to complete analysis before expiration, shall ACZ proceed with requested short HT analyses? YES [X] NO [ ]

If "NO" then ACZ will contact client for further instruction. If neither "YES" nor "NO" is indicated, ACZ will proceed with the requested analyses, even if HT is expired, and data will be qualified.

Are samples for SDWA Compliance Monitoring? Yes [ ] No [X]

If yes, please include state forms. Results will be reported to PQL for Colorado.

Sampler's Name: B.W. Iqbal Sampler's Site Information State NM Zip code 87020 Time Zone MST

\*Sampler's Signature: [Signature] \*I attest to the accuracy and validity of this sample. I understand that intentionally mislabeling the time/date/location or tampering with the sample in anyway, is considered fraud and punishable by State Law.

PROJECT INFORMATION

Table with columns for Quota #, PO#, Reporting state, Matrix, # of Containers, and various analysis results for samples 31-02 TRB-R, 32-45 KD-R, and 36-06 KD.

Matrix SW (Surface Water) - GW (Ground Water) - WW (Waste Water) - DW (Drinking Water) - SL (Sludge) - SO (Soil) - OL (Oil) - Other (Specify)

REMARKS

RAML COC# 20-20. Note different COC's may have different PO's. Shipment of 1 Coolers. Please CC report to: cshort@intera.com, apersico@intera.com, Michaella.Gorospe@bhpbilliton.com, jcarroll@intera.com

Please refer to ACZ's terms & conditions located on the reverse side of this COC.

Table with columns for RELINQUISHED BY, DATE:TIME, RECEIVED BY, and DATE:TIME. Includes handwritten signatures and dates.

FRMAD050.06.14.14

White - Return with sample. Yellow - Retain for your records.

58040 Chain of Custody