

January 06, 2021

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, Michaella Gorospe

Project ID: 4508122295  
ACZ Project ID: L62871

Kent Applegate:

Enclosed are revised analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on November 14, 2020 and originally reported on January 05, 2021. Refer to the case narrative for an explanation of the changes. This project was assigned to ACZ's project number, L62871. 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 L62871. 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 04, 2021. 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

January 06, 2021

Project ID: 4508122295

ACZ Project ID: L62871

#### Sample Receipt

ACZ Laboratories, Inc. (ACZ) received 5 groundwater samples from Rio Algom Mining Company on November 14, 2020. The samples were received in good condition. Upon receipt, the sample custodian removed the samples from the cooler, inspected the contents, and logged the samples into ACZ's computerized Laboratory Information Management System (LIMS). The samples were assigned ACZ LIMS project number L62871. 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

These samples were 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:

This project has been revised to remove an extraneous analysis.

1. (DE) Applies to: L62871-04/CYANIDE

Sample displayed positive interference in the form of an odd peak shape. Sample was analyzed on subsequent dilutions until normal peak shape was observed. Diluted results indicated that CN is present in the sample however, positive interference may still be a factor.

2. (N1A) Applies to: L62871-01/RADIUM 226  
L62871-02/RADIUM 226

Carrier recovery of associated duplicate outside of acceptance limits due to sample matrix interference.

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 30-06 TRB

ACZ Sample ID: **L62871-01**

Date Sampled: 11/12/20 11:04

Date Received: 11/14/20

Sample Matrix: Groundwater

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP	5	<0.25	U		mg/L	0.25	1.25	11/20/20 21:30	jlw
Arsenic, dissolved	M200.8 ICP-MS	5	<0.001	U		mg/L	0.001	0.005	11/23/20 11:29	mfm
Barium, dissolved	M200.7 ICP	5	<0.035	U		mg/L	0.035	0.175	11/20/20 21:30	jlw
Beryllium, dissolved	M200.8 ICP-MS	5	<0.0004	U		mg/L	0.0004	0.00125	11/23/20 11:29	mfm
Boron, dissolved	M200.7 ICP	5	0.537			mg/L	0.1	0.5	11/20/20 21:30	jlw
Cadmium, dissolved	M200.8 ICP-MS	5	<0.00025	U		mg/L	0.00025	0.00125	11/23/20 11:29	mfm
Calcium, dissolved	M200.7 ICP	5	629			mg/L	0.5	2.5	11/20/20 21:30	jlw
Chromium, dissolved	M200.8 ICP-MS	5	<0.0025	U		mg/L	0.0025	0.01	11/23/20 11:29	mfm
Cobalt, dissolved	M200.7 ICP	5	<0.05	U		mg/L	0.05	0.25	11/20/20 21:30	jlw
Copper, dissolved	M200.7 ICP	5	<0.05	U		mg/L	0.05	0.25	11/23/20 15:20	jlw
Iron, dissolved	M200.7 ICP	5	<0.3	U		mg/L	0.3	0.75	11/20/20 21:30	jlw
Lead, dissolved	M200.8 ICP-MS	5	<0.0005	U		mg/L	0.0005	0.0025	11/23/20 11:29	mfm
Magnesium, dissolved	M200.7 ICP	5	537			mg/L	1	5	11/20/20 21:30	jlw
Manganese, dissolved	M200.7 ICP	5	0.494			mg/L	0.05	0.25	11/20/20 21:30	jlw
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	11/23/20 12:57	llr
Molybdenum, dissolved	M200.8 ICP-MS	5	0.00370			mg/L	0.001	0.0025	11/23/20 11:29	mfm
Nickel, dissolved	M200.8 ICP-MS	5	0.01000			mg/L	0.002	0.005	11/23/20 11:29	mfm
Potassium, dissolved	M200.7 ICP	5	16.1			mg/L	1	5	11/20/20 21:30	jlw
Selenium, dissolved	SM 3114 B, AA-Hydride	1	<0.002	U		mg/L	0.002	0.005	12/02/20 15:36	kja
Selenium, dissolved	M200.8 ICP-MS	5	0.00075	B		mg/L	0.0005	0.00125	11/23/20 11:29	mfm
Silver, dissolved	M200.7 ICP	5	<0.05	U	*	mg/L	0.05	0.125	11/20/20 21:30	jlw
Sodium, dissolved	M200.7 ICP	5	560			mg/L	1	5	11/20/20 21:30	jlw
Thallium, dissolved	M200.8 ICP-MS	5	<0.0005	U		mg/L	0.0005	0.0025	11/23/20 11:29	mfm
Uranium, dissolved	M200.8 ICP-MS	5	0.0764			mg/L	0.0005	0.0025	11/23/20 11:29	mfm
Zinc, dissolved	M200.7 ICP	5	<0.1	U		mg/L	0.1	0.25	11/20/20 21:30	jlw

**Rio Algom Mining Company**

Project ID: 4508122295  
 Sample ID: 30-06 TRB

ACZ Sample ID: **L62871-01**  
 Date Sampled: 11/12/20 11:04  
 Date Received: 11/14/20  
 Sample Matrix: Groundwater

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	565			mg/L	2	20	11/17/20 0:00	mlh
Carbonate as CaCO3		1	<2	U		mg/L	2	20	11/17/20 0:00	mlh
Hydroxide as CaCO3		1	<2	U		mg/L	2	20	11/17/20 0:00	mlh
Total Alkalinity		1	565			mg/L	2	20	11/17/20 0:00	mlh
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-2.9			%			01/06/21 0:00	calc
Sum of Anions			107			meq/L			01/06/21 0:00	calc
Sum of Cations			101			meq/L			01/06/21 0:00	calc
Chloride	M300.0 - Ion Chromatography	50	828			mg/L	20	100	11/20/20 20:57	krh
Cyanide, Total	D7511-09	1	<0.003	U		mg/L	0.003	0.01	11/18/20 14:00	rbt
Fluoride	M300.0 - Ion Chromatography	50	<2.5	U	*	mg/L	2.5	12.5	12/02/20 20:32	krh
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	1	0.209		*	mg/L	0.02	0.1	11/26/20 2:03	pjb
pH (lab)	SM4500H+ B									
pH		1	7.8	H		units	0.1	0.1	11/17/20 0:00	mlh
pH measured at		1	22.0			C	0.1	0.1	11/17/20 0:00	mlh
Residue, Filterable (TDS) @180C	SM2540C	2	6000		*	mg/L	40	80	11/17/20 18:07	scd
Sulfate	M300.0 - Ion Chromatography	50	3440			mg/L	20	100	11/20/20 20:57	krh
TDS (calculated)	Calculation		6360			mg/L			01/06/21 0:00	calc
TDS (ratio - measured/calculated)	Calculation		0.94						01/06/21 0:00	calc

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 03-60 TRB

ACZ Sample ID: **L62871-02**

Date Sampled: 11/12/20 10:04

Date Received: 11/14/20

Sample Matrix: Groundwater

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP	5	<0.25	U		mg/L	0.25	1.25	11/20/20 21:33	jlw
Arsenic, dissolved	M200.8 ICP-MS	5	<0.001	U		mg/L	0.001	0.005	11/23/20 11:31	mfm
Barium, dissolved	M200.7 ICP	5	<0.035	U		mg/L	0.035	0.175	11/20/20 21:33	jlw
Beryllium, dissolved	M200.8 ICP-MS	5	<0.0004	U		mg/L	0.0004	0.00125	11/23/20 11:31	mfm
Boron, dissolved	M200.7 ICP	5	0.478	B		mg/L	0.1	0.5	11/20/20 21:33	jlw
Cadmium, dissolved	M200.8 ICP-MS	5	<0.00025	U		mg/L	0.00025	0.00125	11/23/20 11:31	mfm
Calcium, dissolved	M200.7 ICP	5	586			mg/L	0.5	2.5	11/20/20 21:33	jlw
Chromium, dissolved	M200.8 ICP-MS	5	<0.0025	U		mg/L	0.0025	0.01	11/23/20 11:31	mfm
Cobalt, dissolved	M200.7 ICP	5	<0.05	U		mg/L	0.05	0.25	11/20/20 21:33	jlw
Copper, dissolved	M200.7 ICP	5	<0.05	U		mg/L	0.05	0.25	11/23/20 15:23	jlw
Iron, dissolved	M200.7 ICP	5	<0.3	U		mg/L	0.3	0.75	11/20/20 21:33	jlw
Lead, dissolved	M200.8 ICP-MS	5	<0.0005	U		mg/L	0.0005	0.0025	11/23/20 11:31	mfm
Magnesium, dissolved	M200.7 ICP	5	501			mg/L	1	5	11/20/20 21:33	jlw
Manganese, dissolved	M200.7 ICP	5	0.457			mg/L	0.05	0.25	11/20/20 21:33	jlw
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	11/23/20 13:00	llr
Molybdenum, dissolved	M200.8 ICP-MS	5	0.00369			mg/L	0.001	0.0025	11/23/20 11:31	mfm
Nickel, dissolved	M200.8 ICP-MS	5	0.0104			mg/L	0.002	0.005	11/23/20 11:31	mfm
Potassium, dissolved	M200.7 ICP	5	15.1			mg/L	1	5	11/20/20 21:33	jlw
Selenium, dissolved	SM 3114 B, AA-Hydride	1	<0.002	U		mg/L	0.002	0.005	12/02/20 15:39	kja
Selenium, dissolved	M200.8 ICP-MS	5	<0.0005	U		mg/L	0.0005	0.00125	11/23/20 11:31	mfm
Silver, dissolved	M200.7 ICP	5	<0.05	U	*	mg/L	0.05	0.125	11/20/20 21:33	jlw
Sodium, dissolved	M200.7 ICP	5	525			mg/L	1	5	11/20/20 21:33	jlw
Thallium, dissolved	M200.8 ICP-MS	5	<0.0005	U		mg/L	0.0005	0.0025	11/23/20 11:31	mfm
Uranium, dissolved	M200.8 ICP-MS	5	0.0771			mg/L	0.0005	0.0025	11/23/20 11:31	mfm
Zinc, dissolved	M200.7 ICP	5	<0.1	U		mg/L	0.1	0.25	11/20/20 21:33	jlw

**Rio Algom Mining Company**

Project ID: 4508122295  
Sample ID: 03-60 TRB

ACZ Sample ID: **L62871-02**  
Date Sampled: 11/12/20 10:04  
Date Received: 11/14/20  
Sample Matrix: Groundwater

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	581			mg/L	2	20	11/17/20 0:00	mlh
Carbonate as CaCO3		1	<2	U		mg/L	2	20	11/17/20 0:00	mlh
Hydroxide as CaCO3		1	<2	U		mg/L	2	20	11/17/20 0:00	mlh
Total Alkalinity		1	581			mg/L	2	20	11/17/20 0:00	mlh
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-6.9			%			01/06/21 0:00	calc
Sum of Anions			108			meq/L			01/06/21 0:00	calc
Sum of Cations			94			meq/L			01/06/21 0:00	calc
Chloride	M300.0 - Ion Chromatography	50	839			mg/L	20	100	11/20/20 21:51	krh
Cyanide, Total	D7511-09	1	<0.003	U		mg/L	0.003	0.01	11/18/20 14:08	rbt
Fluoride	M300.0 - Ion Chromatography	50	<2.5	U	*	mg/L	2.5	12.5	12/02/20 21:26	krh
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	1	0.196		*	mg/L	0.02	0.1	11/26/20 2:04	pjb
pH (lab)	SM4500H+ B									
pH		1	7.8	H		units	0.1	0.1	11/17/20 0:00	mlh
pH measured at		1	21.9			C	0.1	0.1	11/17/20 0:00	mlh
Residue, Filterable (TDS) @180C	SM2540C	2	6110		*	mg/L	40	80	11/17/20 18:11	scd
Sulfate	M300.0 - Ion Chromatography	50	3480			mg/L	20	100	11/20/20 21:51	krh
TDS (calculated)	Calculation		6300			mg/L			01/06/21 0:00	calc
TDS (ratio - measured/calculated)	Calculation		0.97						01/06/21 0:00	calc

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 30-05 TRA

ACZ Sample ID: **L62871-03**

Date Sampled: 11/12/20 12:07

Date Received: 11/14/20

Sample Matrix: Groundwater

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP	2	<0.1	U		mg/L	0.1	0.5	11/20/20 21:36	jlw
Arsenic, dissolved	M200.8 ICP-MS	2	0.00211			mg/L	0.0004	0.002	11/23/20 11:32	mfm
Barium, dissolved	M200.7 ICP	2	0.0228	B		mg/L	0.014	0.07	11/20/20 21:36	jlw
Beryllium, dissolved	M200.8 ICP-MS	2	<0.00016	U		mg/L	0.00016	0.0005	11/23/20 11:32	mfm
Boron, dissolved	M200.7 ICP	2	0.413			mg/L	0.04	0.2	11/20/20 21:36	jlw
Cadmium, dissolved	M200.8 ICP-MS	2	<0.0001	U		mg/L	0.0001	0.0005	11/23/20 11:32	mfm
Calcium, dissolved	M200.7 ICP	2	159			mg/L	0.2	1	11/20/20 21:36	jlw
Chromium, dissolved	M200.8 ICP-MS	2	<0.001	U		mg/L	0.001	0.004	11/23/20 11:32	mfm
Cobalt, dissolved	M200.7 ICP	2	<0.02	U		mg/L	0.02	0.1	11/20/20 21:36	jlw
Copper, dissolved	M200.7 ICP	2	<0.02	U		mg/L	0.02	0.1	11/23/20 15:33	jlw
Iron, dissolved	M200.7 ICP	2	<0.12	U		mg/L	0.12	0.3	11/20/20 21:36	jlw
Lead, dissolved	M200.8 ICP-MS	2	<0.0002	U		mg/L	0.0002	0.001	11/23/20 11:32	mfm
Magnesium, dissolved	M200.7 ICP	2	67.7			mg/L	0.4	2	11/20/20 21:36	jlw
Manganese, dissolved	M200.7 ICP	2	0.129			mg/L	0.02	0.1	11/20/20 21:36	jlw
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	11/23/20 13:03	llr
Molybdenum, dissolved	M200.8 ICP-MS	2	0.0231			mg/L	0.0004	0.001	11/23/20 11:32	mfm
Nickel, dissolved	M200.8 ICP-MS	2	0.00380			mg/L	0.0008	0.002	11/23/20 11:32	mfm
Potassium, dissolved	M200.7 ICP	2	8.93			mg/L	0.4	2	11/20/20 21:36	jlw
Selenium, dissolved	SM 3114 B, AA-Hydride	1	<0.002	U		mg/L	0.002	0.005	12/02/20 15:41	kja
Selenium, dissolved	M200.8 ICP-MS	2	<0.0002	U		mg/L	0.0002	0.0005	11/23/20 11:32	mfm
Silver, dissolved	M200.7 ICP	2	<0.02	U	*	mg/L	0.02	0.05	11/20/20 21:36	jlw
Sodium, dissolved	M200.7 ICP	2	361			mg/L	0.4	2	11/20/20 21:36	jlw
Thallium, dissolved	M200.8 ICP-MS	2	<0.0002	U		mg/L	0.0002	0.001	11/23/20 11:32	mfm
Uranium, dissolved	M200.8 ICP-MS	2	0.00521			mg/L	0.0002	0.001	11/23/20 11:32	mfm
Zinc, dissolved	M200.7 ICP	2	<0.04	U		mg/L	0.04	0.1	11/20/20 21:36	jlw

**Rio Algom Mining Company**

Project ID: 4508122295  
Sample ID: 30-05 TRA

ACZ Sample ID: **L62871-03**  
Date Sampled: 11/12/20 12:07  
Date Received: 11/14/20  
Sample Matrix: Groundwater

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	156			mg/L	2	20	11/17/20 0:00	mlh
Carbonate as CaCO3		1	<2	U		mg/L	2	20	11/17/20 0:00	mlh
Hydroxide as CaCO3		1	<2	U		mg/L	2	20	11/17/20 0:00	mlh
Total Alkalinity		1	156			mg/L	2	20	11/17/20 0:00	mlh
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-4.8			%			01/06/21 0:00	calc
Sum of Anions			33			meq/L			01/06/21 0:00	calc
Sum of Cations			30			meq/L			01/06/21 0:00	calc
Chloride	M300.0 - Ion Chromatography	20	44.0			mg/L	8	40	11/20/20 22:09	krh
Cyanide, Total	D7511-09	1	<0.003	U		mg/L	0.003	0.01	11/18/20 14:10	rbt
Fluoride	M300.0 - Ion Chromatography	20	<1	U	*	mg/L	1	5	12/02/20 21:44	krh
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	1	0.198		*	mg/L	0.02	0.1	11/26/20 2:05	pjb
pH (lab)	SM4500H+ B									
pH		1	8.1	H		units	0.1	0.1	11/17/20 0:00	mlh
pH measured at		1	21.8			C	0.1	0.1	11/17/20 0:00	mlh
Residue, Filterable (TDS) @180C	SM2540C	1	2050		*	mg/L	20	40	11/17/20 18:14	scd
Sulfate	M300.0 - Ion Chromatography	20	1360			mg/L	8	40	11/20/20 22:09	krh
TDS (calculated)	Calculation		2100			mg/L			01/06/21 0:00	calc
TDS (ratio - measured/calculated)	Calculation		0.98						01/06/21 0:00	calc



### Rio Algom Mining Company

Project ID: 4508122295

Sample ID: 30-07 KD

ACZ Sample ID: **L62871-04**

Date Sampled: 11/12/20 13:21

Date Received: 11/14/20

Sample Matrix: Groundwater

#### Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP	5	<0.25	U		mg/L	0.25	1.25	11/20/20 21:40	jlw
Arsenic, dissolved	M200.8 ICP-MS	5	0.00363	B		mg/L	0.001	0.005	11/23/20 11:34	mfm
Barium, dissolved	M200.7 ICP	5	<0.035	U		mg/L	0.035	0.175	11/20/20 21:40	jlw
Beryllium, dissolved	M200.8 ICP-MS	5	<0.0004	U		mg/L	0.0004	0.00125	11/23/20 11:34	mfm
Boron, dissolved	M200.7 ICP	5	0.259	B		mg/L	0.1	0.5	11/20/20 21:40	jlw
Cadmium, dissolved	M200.8 ICP-MS	5	<0.00025	U		mg/L	0.00025	0.00125	11/23/20 11:34	mfm
Calcium, dissolved	M200.7 ICP	5	640			mg/L	0.5	2.5	11/20/20 21:40	jlw
Chromium, dissolved	M200.8 ICP-MS	5	<0.0025	U		mg/L	0.0025	0.01	11/23/20 11:34	mfm
Cobalt, dissolved	M200.7 ICP	5	<0.05	U		mg/L	0.05	0.25	11/20/20 21:40	jlw
Copper, dissolved	M200.7 ICP	5	<0.05	U		mg/L	0.05	0.25	11/23/20 15:36	jlw
Iron, dissolved	M200.7 ICP	5	1.91			mg/L	0.3	0.75	11/20/20 21:40	jlw
Lead, dissolved	M200.8 ICP-MS	5	<0.0005	U		mg/L	0.0005	0.0025	11/23/20 11:34	mfm
Magnesium, dissolved	M200.7 ICP	5	156			mg/L	1	5	11/20/20 21:40	jlw
Manganese, dissolved	M200.7 ICP	5	2.51			mg/L	0.05	0.25	11/20/20 21:40	jlw
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	11/23/20 13:04	llr
Molybdenum, dissolved	M200.8 ICP-MS	5	0.00116	B		mg/L	0.001	0.0025	11/23/20 11:34	mfm
Nickel, dissolved	M200.8 ICP-MS	5	<0.002	U		mg/L	0.002	0.005	11/23/20 11:34	mfm
Potassium, dissolved	M200.7 ICP	5	13.9			mg/L	1	5	11/20/20 21:40	jlw
Selenium, dissolved	SM 3114 B, AA-Hydride	1	<0.002	U		mg/L	0.002	0.005	12/02/20 15:43	kja
Selenium, dissolved	M200.8 ICP-MS	5	<0.0005	U		mg/L	0.0005	0.00125	11/23/20 11:34	mfm
Silver, dissolved	M200.7 ICP	5	<0.05	U	*	mg/L	0.05	0.125	11/20/20 21:40	jlw
Sodium, dissolved	M200.7 ICP	5	364			mg/L	1	5	11/20/20 21:40	jlw
Thallium, dissolved	M200.8 ICP-MS	5	<0.0005	U		mg/L	0.0005	0.0025	11/23/20 11:34	mfm
Uranium, dissolved	M200.8 ICP-MS	5	0.00176	B		mg/L	0.0005	0.0025	11/23/20 11:34	mfm
Zinc, dissolved	M200.7 ICP	5	0.349			mg/L	0.1	0.25	11/20/20 21:40	jlw

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 30-07 KD

ACZ Sample ID: **L62871-04**

Date Sampled: 11/12/20 13:21

Date Received: 11/14/20

Sample Matrix: Groundwater

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	307		*	mg/L	2	20	11/17/20 0:00	mlh
Carbonate as CaCO3		1	<2	U	*	mg/L	2	20	11/17/20 0:00	mlh
Hydroxide as CaCO3		1	<2	U	*	mg/L	2	20	11/17/20 0:00	mlh
Total Alkalinity		1	307		*	mg/L	2	20	11/17/20 0:00	mlh
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-3.1			%			01/06/21 0:00	calc
Sum of Anions			66			meq/L			01/06/21 0:00	calc
Sum of Cations			62			meq/L			01/06/21 0:00	calc
Chloride	M300.0 - Ion Chromatography	50	447		*	mg/L	20	100	11/20/20 22:27	krh
Cyanide, Total	D7511-09	20	0.41	H	*	mg/L	0.06	0.2	11/30/20 10:59	rbt
Fluoride	M300.0 - Ion Chromatography	50	<2.5	U	*	mg/L	2.5	12.5	12/02/20 22:01	krh
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	1	<0.02	U	*	mg/L	0.02	0.1	11/26/20 2:11	pjb
pH (lab)	SM4500H+ B									
pH		1	7.8	H	*	units	0.1	0.1	11/17/20 0:00	mlh
pH measured at		1	21.8		*	C	0.1	0.1	11/17/20 0:00	mlh
Residue, Filterable (TDS) @180C	SM2540C	2	4080		*	mg/L	40	80	11/19/20 13:00	scd
Sulfate	M300.0 - Ion Chromatography	50	2250		*	mg/L	20	100	11/20/20 22:27	krh
TDS (calculated)	Calculation		4060			mg/L			01/06/21 0:00	calc
TDS (ratio - measured/calculated)	Calculation		1.00						01/06/21 0:00	calc

**Rio Algom Mining Company**

Project ID: 4508122295  
Sample ID: 31-03 KD

ACZ Sample ID: **L62871-05**  
Date Sampled: 11/12/20 14:46  
Date Received: 11/14/20  
Sample Matrix: Groundwater

Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP	5	<0.25	U		mg/L	0.25	1.25	11/20/20 21:43	jlw
Arsenic, dissolved	M200.8 ICP-MS	5	0.0213			mg/L	0.001	0.005	11/23/20 11:36	mfm
Barium, dissolved	M200.7 ICP	5	<0.035	U		mg/L	0.035	0.175	11/20/20 21:43	jlw
Beryllium, dissolved	M200.8 ICP-MS	5	<0.0004	U		mg/L	0.0004	0.00125	11/23/20 11:36	mfm
Boron, dissolved	M200.7 ICP	5	0.184	B		mg/L	0.1	0.5	11/20/20 21:43	jlw
Cadmium, dissolved	M200.8 ICP-MS	5	0.000791	B		mg/L	0.00025	0.00125	11/23/20 11:36	mfm
Calcium, dissolved	M200.7 ICP	5	730			mg/L	0.5	2.5	11/20/20 21:43	jlw
Chromium, dissolved	M200.8 ICP-MS	5	<0.0025	U		mg/L	0.0025	0.01	11/23/20 11:36	mfm
Cobalt, dissolved	M200.7 ICP	5	<0.05	U		mg/L	0.05	0.25	11/20/20 21:43	jlw
Copper, dissolved	M200.7 ICP	5	<0.05	U		mg/L	0.05	0.25	11/23/20 15:39	jlw
Iron, dissolved	M200.7 ICP	5	3.70			mg/L	0.3	0.75	11/20/20 21:43	jlw
Lead, dissolved	M200.8 ICP-MS	5	<0.0005	U		mg/L	0.0005	0.0025	11/23/20 11:36	mfm
Magnesium, dissolved	M200.7 ICP	5	390			mg/L	1	5	11/20/20 21:43	jlw
Manganese, dissolved	M200.7 ICP	5	5.98			mg/L	0.05	0.25	11/20/20 21:43	jlw
Mercury, total	M245.1 CVAA	1	<0.0002	U		mg/L	0.0002	0.001	11/23/20 13:05	llr
Molybdenum, dissolved	M200.8 ICP-MS	5	4.14			mg/L	0.001	0.0025	11/23/20 11:36	mfm
Nickel, dissolved	M200.8 ICP-MS	5	0.00729			mg/L	0.002	0.005	11/23/20 11:36	mfm
Potassium, dissolved	M200.7 ICP	5	15.6			mg/L	1	5	11/20/20 21:43	jlw
Selenium, dissolved	SM 3114 B, AA-Hydride	1	<0.002	U		mg/L	0.002	0.005	12/02/20 15:45	kja
Selenium, dissolved	M200.8 ICP-MS	5	<0.0005	U		mg/L	0.0005	0.00125	11/23/20 11:36	mfm
Silver, dissolved	M200.7 ICP	5	<0.05	U	*	mg/L	0.05	0.125	11/20/20 21:43	jlw
Sodium, dissolved	M200.7 ICP	5	625			mg/L	1	5	11/20/20 21:43	jlw
Thallium, dissolved	M200.8 ICP-MS	5	<0.0005	U		mg/L	0.0005	0.0025	11/23/20 11:36	mfm
Uranium, dissolved	M200.8 ICP-MS	5	0.0240			mg/L	0.0005	0.0025	11/23/20 11:36	mfm
Zinc, dissolved	M200.7 ICP	5	<0.1	U		mg/L	0.1	0.25	11/20/20 21:43	jlw

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 31-03 KD

ACZ Sample ID: **L62871-05**

Date Sampled: 11/12/20 14:46

Date Received: 11/14/20

Sample Matrix: Groundwater

Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration									
Bicarbonate as CaCO3		1	313		*	mg/L	2	20	11/17/20 0:00	mlh
Carbonate as CaCO3		1	<2	U	*	mg/L	2	20	11/17/20 0:00	mlh
Hydroxide as CaCO3		1	<2	U	*	mg/L	2	20	11/17/20 0:00	mlh
Total Alkalinity		1	313		*	mg/L	2	20	11/17/20 0:00	mlh
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-4.9			%			01/06/21 0:00	calc
Sum of Anions			107			meq/L			01/06/21 0:00	calc
Sum of Cations			97.0			meq/L			01/06/21 0:00	calc
Chloride	M300.0 - Ion Chromatography	50	1630		*	mg/L	20	100	11/20/20 22:45	krh
Cyanide, Total	D7511-09	1	0.008	B	*	mg/L	0.003	0.01	11/18/20 14:14	rbt
Fluoride	M300.0 - Ion Chromatography	50	<2.5	U	*	mg/L	2.5	12.5	12/02/20 22:19	krh
Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	1	<0.02	U	*	mg/L	0.02	0.1	11/26/20 2:12	pjb
pH (lab)	SM4500H+ B									
pH		1	7.8	H	*	units	0.1	0.1	11/17/20 0:00	mlh
pH measured at		1	21.8		*	C	0.1	0.1	11/17/20 0:00	mlh
Residue, Filterable (TDS) @180C	SM2540C	2	5840		*	mg/L	40	80	11/18/20 12:26	emk
Sulfate	M300.0 - Ion Chromatography	50	2620		*	mg/L	20	100	11/20/20 22:45	krh
TDS (calculated)	Calculation		6210			mg/L			01/06/21 0:00	calc
TDS (ratio - measured/calculated)	Calculation		0.94						01/06/21 0:00	calc

**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	Analyte concentration detected at a value between MDL and PQL. The associated value is an estimated quantity.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
L	Target analyte response was below the laboratory defined negative threshold.
U	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: **L62871**

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>WG509683</b>													
WG509683PBW1	PBW	11/16/20 13:56				7.6	mg/L		-20	20			
WG509683LCSW3	LCSW	11/16/20 14:15	WC201104-10	820.0001		771.4	mg/L	94	90	110			
WG509683LCSW6	LCSW	11/16/20 18:05	WC201104-10	820.0001		778.5	mg/L	95	90	110			
WG509683PBW2	PBW	11/16/20 18:15				3.1	mg/L		-20	20			
WG509683LCSW9	LCSW	11/16/20 20:40	WC201104-10	820.0001		765.9	mg/L	93	90	110			
WG509683PBW3	PBW	11/16/20 20:50				3.2	mg/L		-20	20			
WG509683LCSW12	LCSW	11/17/20 0:34	WC201104-10	820.0001		786.3	mg/L	96	90	110			
WG509683PBW4	PBW	11/17/20 0:44				3.1	mg/L		-20	20			
L62871-05DUP	DUP	11/17/20 3:14			313	298.5	mg/L				5	20	
WG509683LCSW15	LCSW	11/17/20 3:34	WC201104-10	820.0001		793	mg/L	97	90	110			

**Aluminum, dissolved** M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510008</b>													
WG510008ICV	ICV	11/20/20 20:19	II201113-1	2		2.044	mg/L	102	95	105			
WG510008ICB	ICB	11/20/20 20:25				U	mg/L		-0.15	0.15			
WG510008LFB	LFB	11/20/20 20:38	II201112-3	1.0013		1.02	mg/L	102	85	115			
L62892-01AS	AS	11/20/20 21:59	II201112-3	1.0013	U	1.039	mg/L	104	85	115			
L62892-01ASD	ASD	11/20/20 22:02	II201112-3	1.0013	U	1.044	mg/L	104	85	115	0	20	

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

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510109</b>													
WG510109ICV	ICV	11/23/20 11:04	MS201021-2	.05		.04907	mg/L	98	90	110			
WG510109ICB	ICB	11/23/20 11:05				U	mg/L		-0.00044	0.00044			
WG510109LFB	LFB	11/23/20 11:07	MS201117-2	.05005		.05223	mg/L	104	85	115			
L62812-02AS	AS	11/23/20 11:13	MS201117-2	.05005	.00042	.05395	mg/L	107	70	130			
L62812-02ASD	ASD	11/23/20 11:14	MS201117-2	.05005	.00042	.05563	mg/L	110	70	130	3	20	
L62880-03AS	AS	11/23/20 11:42	MS201117-2	.05005	.00048	.0504	mg/L	100	70	130			
L62880-03ASD	ASD	11/23/20 11:43	MS201117-2	.05005	.00048	.04852	mg/L	96	70	130	4	20	

**Barium, dissolved** M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510008</b>													
WG510008ICV	ICV	11/20/20 20:19	II201113-1	2		2.0115	mg/L	101	95	105			
WG510008ICB	ICB	11/20/20 20:25				U	mg/L		-0.021	0.021			
WG510008LFB	LFB	11/20/20 20:38	II201112-3	.5		.4823	mg/L	96	85	115			
L62892-01AS	AS	11/20/20 21:59	II201112-3	.5	.0265	.5064	mg/L	96	85	115			
L62892-01ASD	ASD	11/20/20 22:02	II201112-3	.5	.0265	.5121	mg/L	97	85	115	1	20	

Rio Algom Mining Company

ACZ Project ID: **L62871**

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>WG510109</b>													
WG510109ICV	ICV	11/23/20 11:04	MS201021-2	.05		.049256	mg/L	99	90	110			
WG510109ICB	ICB	11/23/20 11:05				U	mg/L		-0.000176	0.000176			
WG510109LFB	LFB	11/23/20 11:07	MS201117-2	.05005		.051378	mg/L	103	85	115			
L62812-02AS	AS	11/23/20 11:13	MS201117-2	.05005	U	.053684	mg/L	107	70	130			
L62812-02ASD	ASD	11/23/20 11:14	MS201117-2	.05005	U	.053294	mg/L	106	70	130	1	20	
L62880-03AS	AS	11/23/20 11:42	MS201117-2	.05005	U	.045666	mg/L	91	70	130			
L62880-03ASD	ASD	11/23/20 11:43	MS201117-2	.05005	U	.042458	mg/L	85	70	130	7	20	

**Boron, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510008</b>													
WG510008ICV	ICV	11/20/20 20:19	II201113-1	2		1.996	mg/L	100	95	105			
WG510008ICB	ICB	11/20/20 20:25				U	mg/L		-0.06	0.06			
WG510008LFB	LFB	11/20/20 20:38	II201112-3	.5005		.499	mg/L	100	85	115			
L62892-01AS	AS	11/20/20 21:59	II201112-3	.5005	.277	.761	mg/L	97	85	115			
L62892-01ASD	ASD	11/20/20 22:02	II201112-3	.5005	.277	.771	mg/L	99	85	115	1	20	

**Cadmium, dissolved**

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510109</b>													
WG510109ICV	ICV	11/23/20 11:04	MS201021-2	.05		.049697	mg/L	99	90	110			
WG510109ICB	ICB	11/23/20 11:05				U	mg/L		-0.00011	0.00011			
WG510109LFB	LFB	11/23/20 11:07	MS201117-2	.05005		.050503	mg/L	101	85	115			
L62812-02AS	AS	11/23/20 11:13	MS201117-2	.05005	.000631	.051667	mg/L	102	70	130			
L62812-02ASD	ASD	11/23/20 11:14	MS201117-2	.05005	.000631	.051431	mg/L	101	70	130	0	20	
L62880-03AS	AS	11/23/20 11:42	MS201117-2	.05005	U	.047776	mg/L	95	70	130			
L62880-03ASD	ASD	11/23/20 11:43	MS201117-2	.05005	U	.044921	mg/L	90	70	130	6	20	

**Calcium, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510008</b>													
WG510008ICV	ICV	11/20/20 20:19	II201113-1	100		99.53	mg/L	100	95	105			
WG510008ICB	ICB	11/20/20 20:25				U	mg/L		-0.3	0.3			
WG510008LFB	LFB	11/20/20 20:38	II201112-3	68.0028		67.65	mg/L	99	85	115			
L62892-01AS	AS	11/20/20 21:59	II201112-3	68.0028	54.6	120.6	mg/L	97	85	115			
L62892-01ASD	ASD	11/20/20 22:02	II201112-3	68.0028	54.6	121.4	mg/L	98	85	115	1	20	

**Chloride**

M300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG507545</b>													
WG507545ICV	ICV	10/20/20 9:34	WI201018-2	20.02		19.86	mg/L	99	90	110			
WG507545ICB	ICB	10/20/20 9:52				U	mg/L		-0.4	0.4			
<b>WG509839</b>													
WG509839LFB	LFB	11/20/20 18:34	WI201018-4	30		32.38	mg/L	108	90	110			
L62864-01DUP	DUP	11/20/20 19:10			55.9	57.46	mg/L				3	20	
L62864-02AS	AS	11/20/20 19:46	WI201018-4	300	41.3	356.95	mg/L	105	90	110			

Rio Algom Mining Company

ACZ Project ID: **L62871**

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.

**Chromium, dissolved**

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510109</b>													
WG510109ICV	ICV	11/23/20 11:04	MS201021-2	.05		.0508	mg/L	102	90	110			
WG510109ICB	ICB	11/23/20 11:05				U	mg/L		-0.0011	0.0011			
WG510109LFB	LFB	11/23/20 11:07	MS201117-2	.05		.05194	mg/L	104	85	115			
L62812-02AS	AS	11/23/20 11:13	MS201117-2	.05	U	.04934	mg/L	99	70	130			
L62812-02ASD	ASD	11/23/20 11:14	MS201117-2	.05	U	.05049	mg/L	101	70	130	2	20	
L62880-03AS	AS	11/23/20 11:42	MS201117-2	.05	U	.04731	mg/L	95	70	130			
L62880-03ASD	ASD	11/23/20 11:43	MS201117-2	.05	U	.04441	mg/L	89	70	130	6	20	

**Cobalt, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510008</b>													
WG510008ICV	ICV	11/20/20 20:19	II201113-1	2.004		1.986	mg/L	99	95	105			
WG510008ICB	ICB	11/20/20 20:25				U	mg/L		-0.03	0.03			
WG510008LFB	LFB	11/20/20 20:38	II201112-3	.5		.469	mg/L	94	85	115			
L62892-01AS	AS	11/20/20 21:59	II201112-3	.5	U	.465	mg/L	93	85	115			
L62892-01ASD	ASD	11/20/20 22:02	II201112-3	.5	U	.469	mg/L	94	85	115	1	20	

**Copper, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510105</b>													
WG510105ICV	ICV	11/23/20 13:57	II201113-1	2		1.915	mg/L	96	95	105			
WG510105ICB	ICB	11/23/20 14:03				U	mg/L		-0.03	0.03			
WG510105LFB	LFB	11/23/20 14:16	II201123-3	.5015		.473	mg/L	94	85	115			
L62864-05AS	AS	11/23/20 15:14	II201123-3	.5015	U	.479	mg/L	96	85	115			
L62864-05ASD	ASD	11/23/20 15:17	II201123-3	.5015	U	.472	mg/L	94	85	115	1	20	

**Cyanide, Total**

D7511-09

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG509875</b>													
WG509875ICV	ICV	11/18/20 13:36	WI201114-4	.3		.2855	mg/L	95	90	110			
WG509875ICB	ICB	11/18/20 13:38				U	mg/L		-0.003	0.003			
WG509875LFB	LFB	11/18/20 13:44	WI201114-7	.1		.1002	mg/L	100	84	116			
L62765-01AS	AS	11/18/20 13:48	WI201114-7	.1	.004	.1183	mg/L	114	84	116			
L62765-01ASD	ASD	11/18/20 13:50	WI201114-7	.1	.004	.0984	mg/L	94	84	116	18	20	
<b>WG510349</b>													
WG510349ICV	ICV	11/30/20 10:49	WI201129-5	.3003		.273	mg/L	91	90	110			
WG510349ICB	ICB	11/30/20 10:51				U	mg/L		-0.003	0.003			
L62933-01AS	AS	11/30/20 11:07	WI201129-6	.1	U	.1025	mg/L	103	84	116			
L62933-01ASD	ASD	11/30/20 11:09	WI201129-6	.1	U	.115	mg/L	115	84	116	11	20	
WG510349LFB	LFB	11/30/20 11:13	WI201129-6	.1		.1115	mg/L	112	84	116			
WG510349ICV1	ICV	11/30/20 13:07	WI201129-5	.3003		.276	mg/L	92	90	110			
WG510349ICB1	ICB	11/30/20 13:09				U	mg/L		-0.003	0.003			



Rio Algom Mining Company

ACZ Project ID: **L62871**

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.

Fluoride													
M300.0 - Ion Chromatography													
ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG507545</b>													
WG507545ICV	ICV	10/20/20 9:34	WI201018-2	4		3.959	mg/L	99	90	110			
WG507545ICB	ICB	10/20/20 9:52				U	mg/L		-0.05	0.05			
<b>WG509839</b>													
WG509839LFB	LFB	12/02/20 18:09	WI201018-4	1.5		1.38	mg/L	92	90	110			
L62864-01DUP	DUP	12/02/20 18:44			1.78	1.685	mg/L				5	20	RA
L62864-02AS	AS	12/02/20 19:20	WI201018-4	15	1.23	14.989	mg/L	92	90	110			
Iron, dissolved													
M200.7 ICP													
ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510008</b>													
WG510008ICV	ICV	11/20/20 20:19	II201113-1	2		1.966	mg/L	98	95	105			
WG510008ICB	ICB	11/20/20 20:25				U	mg/L		-0.18	0.18			
WG510008LFB	LFB	11/20/20 20:38	II201112-3	1.0018		.959	mg/L	96	85	115			
L62892-01AS	AS	11/20/20 21:59	II201112-3	1.0018	U	.977	mg/L	98	85	115			
L62892-01ASD	ASD	11/20/20 22:02	II201112-3	1.0018	U	.985	mg/L	98	85	115	1	20	
Lead, dissolved													
M200.8 ICP-MS													
ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510109</b>													
WG510109ICV	ICV	11/23/20 11:04	MS201021-2	.05		.05015	mg/L	100	90	110			
WG510109ICB	ICB	11/23/20 11:05				U	mg/L		-0.00022	0.00022			
WG510109LFB	LFB	11/23/20 11:07	MS201117-2	.05005		.05162	mg/L	103	85	115			
L62812-02AS	AS	11/23/20 11:13	MS201117-2	.05005	.00014	.05082	mg/L	101	70	130			
L62812-02ASD	ASD	11/23/20 11:14	MS201117-2	.05005	.00014	.05129	mg/L	102	70	130	1	20	
L62880-03AS	AS	11/23/20 11:42	MS201117-2	.05005	.00021	.05323	mg/L	106	70	130			
L62880-03ASD	ASD	11/23/20 11:43	MS201117-2	.05005	.00021	.05006	mg/L	100	70	130	6	20	
Magnesium, dissolved													
M200.7 ICP													
ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510008</b>													
WG510008ICV	ICV	11/20/20 20:19	II201113-1	100		100.48	mg/L	100	95	105			
WG510008ICB	ICB	11/20/20 20:25				U	mg/L		-0.6	0.6			
WG510008LFB	LFB	11/20/20 20:38	II201112-3	50.00226		49.23	mg/L	98	85	115			
L62892-01AS	AS	11/20/20 21:59	II201112-3	50.00226	32	80.45	mg/L	97	85	115			
L62892-01ASD	ASD	11/20/20 22:02	II201112-3	50.00226	32	81.23	mg/L	98	85	115	1	20	
Manganese, dissolved													
M200.7 ICP													
ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510008</b>													
WG510008ICV	ICV	11/20/20 20:19	II201113-1	2		1.982	mg/L	99	95	105			
WG510008ICB	ICB	11/20/20 20:25				U	mg/L		-0.03	0.03			
WG510008LFB	LFB	11/20/20 20:38	II201112-3	.5005		.472	mg/L	94	85	115			
L62892-01AS	AS	11/20/20 21:59	II201112-3	.5005	U	.477	mg/L	95	85	115			
L62892-01ASD	ASD	11/20/20 22:02	II201112-3	.5005	U	.481	mg/L	96	85	115	1	20	

Rio Algom Mining Company

ACZ Project ID: **L62871**

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.

Mercury, total													M245.1 CVAA	
ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual	
<b>WG510080</b>														
WG510080ICV1	ICV	11/23/20 11:38	HG201109-2	.005		.00493	mg/L	99	90	110				
WG510080ICB	ICB	11/23/20 11:39				U	mg/L		-0.0006	0.0006				
<b>WG510082</b>														
WG510082LRB	LRB	11/23/20 12:53				U	mg/L		-0.00044	0.00044				
WG510082LFB	LFB	11/23/20 12:54	HG201116-3	.002002		.00185	mg/L	92	85	115				
L62871-01LFM	LFM	11/23/20 12:58	HG201116-3	.002002	U	.0018	mg/L	90	85	115				
L62871-01LFMD	LFMD	11/23/20 12:59	HG201116-3	.002002	U	.00186	mg/L	93	85	115	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>WG510109</b>														
WG510109ICV	ICV	11/23/20 11:04	MS201021-2	.01992		.01953	mg/L	98	90	110				
WG510109ICB	ICB	11/23/20 11:05				U	mg/L		-0.00044	0.00044				
WG510109LFB	LFB	11/23/20 11:07	MS201117-2	.0501		.04977	mg/L	99	85	115				
L62812-02AS	AS	11/23/20 11:13	MS201117-2	.0501	.0009	.05022	mg/L	98	70	130				
L62812-02ASD	ASD	11/23/20 11:14	MS201117-2	.0501	.0009	.05038	mg/L	99	70	130	0	20		
L62880-03AS	AS	11/23/20 11:42	MS201117-2	.0501	.00445	.05624	mg/L	103	70	130				
L62880-03ASD	ASD	11/23/20 11:43	MS201117-2	.0501	.00445	.05308	mg/L	97	70	130	6	20		
Nickel, dissolved													M200.8 ICP-MS	
ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual	
<b>WG510109</b>														
WG510109ICV	ICV	11/23/20 11:04	MS201021-2	.05		.04943	mg/L	99	90	110				
WG510109ICB	ICB	11/23/20 11:05				U	mg/L		-0.00088	0.00088				
WG510109LFB	LFB	11/23/20 11:07	MS201117-2	.05		.05074	mg/L	101	85	115				
L62812-02AS	AS	11/23/20 11:13	MS201117-2	.05	.00042	.04841	mg/L	96	70	130				
L62812-02ASD	ASD	11/23/20 11:14	MS201117-2	.05	.00042	.0492	mg/L	98	70	130	2	20		
L62880-03AS	AS	11/23/20 11:42	MS201117-2	.05	.00265	.04577	mg/L	86	70	130				
L62880-03ASD	ASD	11/23/20 11:43	MS201117-2	.05	.00265	.04327	mg/L	81	70	130	6	20		
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>WG510324</b>														
WG510324ICV	ICV	11/25/20 22:45	WI201117-3	2.416		2.41	mg/L	100	90	110				
WG510324ICB	ICB	11/25/20 22:46				U	mg/L		-0.02	0.02				
<b>WG510328</b>														
WG510328LFB	LFB	11/26/20 1:38	WI201001-11	2		1.992	mg/L	100	90	110				
L62866-07DUP	DUP	11/26/20 2:02			U	U	mg/L				0	20	RA	
L62866-06AS	AS	11/26/20 2:19	WI201001-11	4	2.08	6.058	mg/L	99	90	110				

Rio Algom Mining Company

ACZ Project ID: **L62871**

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.

**pH (lab)** SM4500H+ B

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG509683</b>													
WG509683LCSW1	LCSW	11/16/20 14:00	PCN60577	6		6	units	100	5.9	6.1			
WG509683LCSW4	LCSW	11/16/20 17:51	PCN60577	6		6.1	units	102	5.9	6.1			
WG509683LCSW7	LCSW	11/16/20 20:27	PCN60577	6		6	units	100	5.9	6.1			
WG509683LCSW10	LCSW	11/17/20 0:19	PCN60577	6		6	units	100	5.9	6.1			
L62871-05DUP	DUP	11/17/20 3:14			7.8	7.8	units				0	20	
WG509683LCSW13	LCSW	11/17/20 3:19	PCN60577	6		6.1	units	102	5.9	6.1			

**Potassium, dissolved** M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510008</b>													
WG510008ICV	ICV	11/20/20 20:19	II201113-1	20		19.91	mg/L	100	95	105			
WG510008ICB	ICB	11/20/20 20:25				U	mg/L		-0.6	0.6			
WG510008LFB	LFB	11/20/20 20:38	II201112-3	99.96847		97.62	mg/L	98	85	115			
L62892-01AS	AS	11/20/20 21:59	II201112-3	99.96847	12.3	110.2	mg/L	98	85	115			
L62892-01ASD	ASD	11/20/20 22:02	II201112-3	99.96847	12.3	110.8	mg/L	99	85	115	1	20	

**Residue, Filterable (TDS) @180C** SM2540C

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG509800</b>													
WG509800PBW	PBW	11/17/20 17:10				U	mg/L		-20	20			
WG509800LCSW	LCSW	11/17/20 17:13	PCN62453	1000		980	mg/L	98	80	120			
L62830-08DUP	DUP	11/17/20 17:46			1670	1678	mg/L				0	10	
L62871-04DUP	DUP	11/17/20 18:20			4110	4106	mg/L				0	10	
<b>WG509865</b>													
WG509865PBW	PBW	11/18/20 12:15				U	mg/L		-20	20			
WG509865LCSW	LCSW	11/18/20 12:16	PCN62453	1000		988	mg/L	99	80	120			
L62881-05DUP	DUP	11/18/20 12:38			1060	1062	mg/L				0	10	
<b>WG509948</b>													
WG509948PBW	PBW	11/19/20 12:50				U	mg/L		-20	20			
WG509948LCSW	LCSW	11/19/20 12:53	PCN62453	1000		1006	mg/L	101	80	120			
L62891-01DUP	DUP	11/19/20 13:31			104	110	mg/L				6	10	RA

Rio Algom Mining Company

ACZ Project ID: **L62871**

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.

**Selenium, dissolved**

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510109</b>													
WG510109ICV	ICV	11/23/20 11:04	MS201021-2	.05		.04984	mg/L	100	90	110			
WG510109ICB	ICB	11/23/20 11:05				U	mg/L		-0.00022	0.00022			
WG510109LFB	LFB	11/23/20 11:07	MS201117-2	.05		.05121	mg/L	102	85	115			
L62812-02AS	AS	11/23/20 11:13	MS201117-2	.05	.00039	.05382	mg/L	107	70	130			
L62812-02ASD	ASD	11/23/20 11:14	MS201117-2	.05	.00039	.05391	mg/L	107	70	130	0	20	
L62880-03AS	AS	11/23/20 11:42	MS201117-2	.05	.00723	.05933	mg/L	104	70	130			
L62880-03ASD	ASD	11/23/20 11:43	MS201117-2	.05	.00723	.05671	mg/L	99	70	130	5	20	

**Selenium, dissolved**

SM 3114 B, AA-Hydride

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510554</b>													
WG510554ICV	ICV	12/02/20 15:28	SE201005-1	.025		.023	mg/L	92	90	110			
WG510554ICB	ICB	12/02/20 15:30				U	mg/L		-0.006	0.006			
WG510554LRB	LRB	12/02/20 15:32				U	mg/L		-0.006	0.006			
WG510554LFB	LFB	12/02/20 15:34	SE201123-2	.0225		.0211	mg/L	94	85	115			
L62961-02LFM	LFM	12/02/20 15:51	SE201123-2	.0225	U	.0202	mg/L	90	85	115			
L62961-02LFMD	LFMD	12/02/20 15:53	SE201123-2	.0225	U	.021	mg/L	93	85	115	4	20	

**Silver, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510008</b>													
WG510008ICV	ICV	11/20/20 20:19	II201113-1	1		.986	mg/L	99	95	105			
WG510008ICB	ICB	11/20/20 20:25				U	mg/L		-0.03	0.03			
WG510008LFB	LFB	11/20/20 20:38	II201112-3	.5		.518	mg/L	104	85	115			
L62892-01AS	AS	11/20/20 21:59	II201112-3	.5	U	.376	mg/L	75	85	115			M2 ZA
L62892-01ASD	ASD	11/20/20 22:02	II201112-3	.5	U	.358	mg/L	72	85	115	5	20	M2 ZA

**Sodium, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510008</b>													
WG510008ICV	ICV	11/20/20 20:19	II201113-1	100		99.35	mg/L	99	95	105			
WG510008ICB	ICB	11/20/20 20:25				U	mg/L		-0.6	0.6			
WG510008LFB	LFB	11/20/20 20:38	II201112-3	100.0141		96.89	mg/L	97	85	115			
L62892-01AS	AS	11/20/20 21:59	II201112-3	100.0141	104	194.9	mg/L	91	85	115			
L62892-01ASD	ASD	11/20/20 22:02	II201112-3	100.0141	104	197.2	mg/L	93	85	115	1	20	

**Sulfate**

M300.0 - Ion Chromatography

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG507545</b>													
WG507545ICV	ICV	10/20/20 9:34	WI201018-2	50		50.28	mg/L	101	90	110			
WG507545ICB	ICB	10/20/20 9:52				U	mg/L		-0.4	0.4			
<b>WG509839</b>													
WG509839LFB	LFB	11/20/20 18:34	WI201018-4	30		32.3	mg/L	108	90	110			
L62864-01DUP	DUP	11/20/20 19:10			893	909.01	mg/L				2	20	
L62864-02AS	AS	11/20/20 19:46	WI201018-4	300	270	581.23	mg/L	104	90	110			

Rio Algom Mining Company

ACZ Project ID: **L62871**

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.

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

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510109</b>													
WG510109ICV	ICV	11/23/20 11:04	MS201021-2	.05		.04983	mg/L	100	90	110			
WG510109ICB	ICB	11/23/20 11:05				U	mg/L		-0.00022	0.00022			
WG510109LFB	LFB	11/23/20 11:07	MS201117-2	.0501		.05139	mg/L	103	85	115			
L62812-02AS	AS	11/23/20 11:13	MS201117-2	.0501	U	.05128	mg/L	102	70	130			
L62812-02ASD	ASD	11/23/20 11:14	MS201117-2	.0501	U	.05113	mg/L	102	70	130	0	20	
L62880-03AS	AS	11/23/20 11:42	MS201117-2	.0501	U	.05452	mg/L	109	70	130			
L62880-03ASD	ASD	11/23/20 11:43	MS201117-2	.0501	U	.05081	mg/L	101	70	130	7	20	

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

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510109</b>													
WG510109ICV	ICV	11/23/20 11:04	MS201021-2	.05		.05081	mg/L	102	90	110			
WG510109ICB	ICB	11/23/20 11:05				U	mg/L		-0.00022	0.00022			
WG510109LFB	LFB	11/23/20 11:07	MS201117-2	.05		.05205	mg/L	104	85	115			
L62812-02AS	AS	11/23/20 11:13	MS201117-2	.05	U	.05183	mg/L	104	70	130			
L62812-02ASD	ASD	11/23/20 11:14	MS201117-2	.05	U	.05203	mg/L	104	70	130	0	20	
L62880-03AS	AS	11/23/20 11:42	MS201117-2	.05	.0205	.0765	mg/L	112	70	130			
L62880-03ASD	ASD	11/23/20 11:43	MS201117-2	.05	.0205	.07339	mg/L	106	70	130	4	20	

**Zinc, dissolved** M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec%	Lower	Upper	RPD	Limit	Qual
<b>WG510008</b>													
WG510008ICV	ICV	11/20/20 20:19	II201113-1	2		1.944	mg/L	97	95	105			
WG510008ICB	ICB	11/20/20 20:25				U	mg/L		-0.06	0.06			
WG510008LFB	LFB	11/20/20 20:38	II201112-3	.50075		.501	mg/L	100	85	115			
L62892-01AS	AS	11/20/20 21:59	II201112-3	.50075	.051	.566	mg/L	103	85	115			
L62892-01ASD	ASD	11/20/20 22:02	II201112-3	.50075	.051	.554	mg/L	101	85	115	2	20	

Rio Algom Mining Company

ACZ Project ID: **L62871**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
<b>L62871-01</b>	WG509839	Fluoride	M300.0 - Ion Chromatography	DC	Sample required dilution. Non-target analyte exceeded calibration range.
			M300.0 - Ion Chromatography	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).
	WG510328	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).
	WG509800	Residue, Filterable (TDS) @180C	SM2540C	RO	The duplicate originally assigned to this sample was not used for precision assessment because residue density did not meet method limits. Another duplicate in the batch was used to assess precision. Method required duplicate frequency was not met.
	WG510008	Silver, dissolved	M200.7 ICP	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M200.7 ICP	ZA	Poor recovery for Silver quality control is accepted due to low Silver solubility in samples, digestates, or extracts that do not contain sufficient Hydrochloric acid.
<b>L62871-02</b>	WG509839	Fluoride	M300.0 - Ion Chromatography	DC	Sample required dilution. Non-target analyte exceeded calibration range.
			M300.0 - Ion Chromatography	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).
	WG510328	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).
	WG509800	Residue, Filterable (TDS) @180C	SM2540C	RO	The duplicate originally assigned to this sample was not used for precision assessment because residue density did not meet method limits. Another duplicate in the batch was used to assess precision. Method required duplicate frequency was not met.
	WG510008	Silver, dissolved	M200.7 ICP	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M200.7 ICP	ZA	Poor recovery for Silver quality control is accepted due to low Silver solubility in samples, digestates, or extracts that do not contain sufficient Hydrochloric acid.
<b>L62871-03</b>	WG509839	Fluoride	M300.0 - Ion Chromatography	DC	Sample required dilution. Non-target analyte exceeded calibration range.
			M300.0 - Ion Chromatography	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).
	WG510328	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).
	WG509800	Residue, Filterable (TDS) @180C	SM2540C	RO	The duplicate originally assigned to this sample was not used for precision assessment because residue density did not meet method limits. Another duplicate in the batch was used to assess precision. Method required duplicate frequency was not met.
	WG510008	Silver, dissolved	M200.7 ICP	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M200.7 ICP	ZA	Poor recovery for Silver quality control is accepted due to low Silver solubility in samples, digestates, or extracts that do not contain sufficient Hydrochloric acid.

Rio Algom Mining Company

ACZ Project ID: **L62871**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
<b>L62871-04</b>	WG509683	Bicarbonate as CaCO <sub>3</sub>	SM2320B - Titration	Q6	Sample was received above recommended temperature.
		Carbonate as CaCO <sub>3</sub>	SM2320B - Titration	Q6	Sample was received above recommended temperature.
	WG509839	Chloride	M300.0 - Ion Chromatography	Q6	Sample was received above recommended temperature.
	WG510349	Cyanide, Total	D7511-09	DE	Sample required dilution. See Case Narrative.
			D7511-09	HC	Initial analysis within holding time. Reanalysis was past holding time, which was required due to a QC failure during the initial analysis.
	WG509839	Fluoride	D7511-09	Q6	Sample was received above recommended temperature.
			M300.0 - Ion Chromatography	DC	Sample required dilution. Non-target analyte exceeded calibration range.
			M300.0 - Ion Chromatography	Q6	Sample was received above recommended temperature.
			M300.0 - Ion Chromatography	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).
	WG509683	Hydroxide as CaCO <sub>3</sub>	SM2320B - Titration	Q6	Sample was received above recommended temperature.
	WG510328	Nitrate/Nitrite as N	M353.2 - H <sub>2</sub> SO <sub>4</sub> preserved	Q6	Sample was received above recommended temperature.
			M353.2 - H <sub>2</sub> SO <sub>4</sub> 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).
	WG509683	pH pH measured at	SM4500H+ B	Q6	Sample was received above recommended temperature.
			SM4500H+ B	Q6	Sample was received above recommended temperature.
	WG509948	Residue, Filterable (TDS) @180C	SM2540C	Q6	Sample was received above recommended temperature.
			SM2540C	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).
	WG510008	Silver, dissolved	M200.7 ICP	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M200.7 ICP	ZA	Poor recovery for Silver quality control is accepted due to low Silver solubility in samples, digestates, or extracts that do not contain sufficient Hydrochloric acid.
WG509839	Sulfate	M300.0 - Ion Chromatography	Q6	Sample was received above recommended temperature.	
WG509683	Total Alkalinity	SM2320B - Titration	Q6	Sample was received above recommended temperature.	
<b>L62871-05</b>	WG509683	Bicarbonate as CaCO <sub>3</sub>	SM2320B - Titration	Q6	Sample was received above recommended temperature.
		Carbonate as CaCO <sub>3</sub>	SM2320B - Titration	Q6	Sample was received above recommended temperature.
	WG509839	Chloride	M300.0 - Ion Chromatography	Q6	Sample was received above recommended temperature.
	WG509875	Cyanide, Total	D7511-09	Q6	Sample was received above recommended temperature.
	WG509839	Fluoride	M300.0 - Ion Chromatography	DC	Sample required dilution. Non-target analyte exceeded calibration range.
			M300.0 - Ion Chromatography	Q6	Sample was received above recommended temperature.
			M300.0 - Ion Chromatography	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).
	WG509683	Hydroxide as CaCO <sub>3</sub>	SM2320B - Titration	Q6	Sample was received above recommended temperature.
	WG510328	Nitrate/Nitrite as N	M353.2 - H <sub>2</sub> SO <sub>4</sub> preserved	Q6	Sample was received above recommended temperature.
			M353.2 - H <sub>2</sub> SO <sub>4</sub> 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).
	WG509683	pH pH measured at	SM4500H+ B	Q6	Sample was received above recommended temperature.
			SM4500H+ B	Q6	Sample was received above recommended temperature.
	WG509865	Residue, Filterable (TDS) @180C	SM2540C	Q6	Sample was received above recommended temperature.
	WG510008	Silver, dissolved	M200.7 ICP	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
			M200.7 ICP	ZA	Poor recovery for Silver quality control is accepted due to low Silver solubility in samples, digestates, or extracts that do not contain sufficient Hydrochloric acid.
	WG509839	Sulfate	M300.0 - Ion Chromatography	Q6	Sample was received above recommended temperature.
	WG509683	Total Alkalinity	SM2320B - Titration	Q6	Sample was received above recommended temperature.

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 30-06 TRB

Locator:

ACZ Sample ID: **L62871-01**

Date Sampled: 11/12/20 11:04

Date Received: 11/14/20

Sample Matrix: *Groundwater*

Lead 210, dissolved

Prep Method:

EICHROM, OTW01

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Lead 210, dissolved	12/17/20 12:18		16	1.9	2.5	pCi/L	*	tjr

Polonium 210, dissolved

Prep Method:

HASL Po-01-RC

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Polonium 210, dissolved	01/04/21 16:59		0.433	1.5	2.9	pCi/L	*	tjr

Radium 226, dissolved

Prep Method:

M903.1

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226, dissolved	12/15/20 0:14		1.1	0.23	0.11	pCi/L	*	djc

Radium 228, dissolved

Prep Method:

M9320

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228, dissolved	12/10/20 16:20		7.1	1.2	2.3	pCi/L	*	cer

Thorium 230, dissolved

Prep Method:

ESM 4506

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Thorium 230, dissolved	12/03/20 14:15		0.358	0.31	0.46	pCi/L	*	djc



**Rio Algom Mining Company**

Project ID: 4508122295  
 Sample ID: 03-60 TRB  
 Locator:

ACZ Sample ID: **L62871-02**  
 Date Sampled: 11/12/20 10:04  
 Date Received: 11/14/20  
 Sample Matrix: Groundwater

Lead 210, dissolved  
 EICHROM, OTW01

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Lead 210, dissolved	12/17/20 12:18		16	1.7	2	pCi/L	*	tjr

Polonium 210, dissolved  
 HASL Po-01-RC

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Polonium 210, dissolved	01/04/21 16:59		-2.41	2.3	4.9	pCi/L	*	tjr

Radium 226, dissolved  
 M903.1

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226, dissolved	12/15/20 0:15		1.1	0.21	0.18	pCi/L	*	djc

Radium 228, dissolved  
 M9320

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228, dissolved	12/10/20 16:20		5	1	2	pCi/L	*	cer

Thorium 230, dissolved  
 ESM 4506

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Thorium 230, dissolved	12/03/20 14:15		0.418	0.38	0.58	pCi/L	*	djc

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 30-05 TRA

Locator:

ACZ Sample ID: **L62871-03**

Date Sampled: 11/12/20 12:07

Date Received: 11/14/20

Sample Matrix: Groundwater

Lead 210, dissolved

Prep Method:

EICHROM, OTW01

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Lead 210, dissolved	12/17/20 12:18		15	1.8	2.3	pCi/L	*	tjr

Polonium 210, dissolved

Prep Method:

HASL Po-01-RC

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Polonium 210, dissolved	01/04/21 16:59		-3.24	2.3	5.3	pCi/L	*	tjr

Radium 226, dissolved

Prep Method:

M903.1

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226, dissolved	12/15/20 0:17		0.52	0.15	0.06	pCi/L	*	djc

Radium 228, dissolved

Prep Method:

M9320

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228, dissolved	12/10/20 16:20		1.9	1.1	2.4	pCi/L	*	cer

Thorium 230, dissolved

Prep Method:

ESM 4506

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Thorium 230, dissolved	12/03/20 14:15		0.39	0.28	0.35	pCi/L	*	djc

**Rio Algom Mining Company**

Project ID: 4508122295  
 Sample ID: 30-07 KD  
 Locator:

ACZ Sample ID: **L62871-04**  
 Date Sampled: 11/12/20 13:21  
 Date Received: 11/14/20  
 Sample Matrix: Groundwater

Lead 210, dissolved  
 EICHROM, OTW01

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Lead 210, dissolved	12/17/20 15:08		9.5	1.7	2.6	pCi/L	*	tjr

Polonium 210, dissolved  
 HASL Po-01-RC

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Polonium 210, dissolved	01/04/21 16:59		0.46	2.2	4.2	pCi/L	*	tjr

Radium 226, dissolved  
 M903.1

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226, dissolved	12/15/20 0:18		1.4	0.16	0.15	pCi/L	*	djc

Radium 228, dissolved  
 M9320

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228, dissolved	12/10/20 16:20		5.6	1.1	2	pCi/L	*	cer

Thorium 230, dissolved  
 ESM 4506

Prep Method:

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Thorium 230, dissolved	12/03/20 14:15		0.0509	0.32	0.62	pCi/L	*	djc

**Rio Algom Mining Company**

Project ID: 4508122295

Sample ID: 31-03 KD

Locator:

ACZ Sample ID: **L62871-05**

Date Sampled: 11/12/20 14:46

Date Received: 11/14/20

Sample Matrix: Groundwater

Lead 210, dissolved

Prep Method:

EICHROM, OTW01

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Lead 210, dissolved	12/17/20 15:08		8	1.6	2.5	pCi/L	*	tjr

Polonium 210, dissolved

Prep Method:

HASL Po-01-RC

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Polonium 210, dissolved	01/04/21 16:59		1.77	2.5	4.2	pCi/L	*	tjr

Radium 226, dissolved

Prep Method:

M903.1

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226, dissolved	12/15/20 0:20		11	0.45	0.17	pCi/L	*	djc

Radium 228, dissolved

Prep Method:

M9320

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228, dissolved	12/10/20 16:20		9.5	1.2	1.9	pCi/L	*	cer

Thorium 230, dissolved

Prep Method:

ESM 4506

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Thorium 230, dissolved	12/03/20 14:15		0.424	0.47	0.77	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://acz.com/wp-content/uploads/2019/04/Ext-Qual-List.pdf>

Rio Algom Mining Company

ACZ Project ID: **L62871**

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.

**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>WG510456</b>																
WG510456LCSW	LCSW	12/17/20	PCN59630	95.91				100	3.7	2.4	104	55	121			
WG510456PBW	PBW	12/17/20						.41	1.2	2.2			4.4			
L62871-05MS	MS	12/17/20	PCN59630	95.91	8	1.6	2.5	100	3.7	2.2	96	55	121			
L62871-03DUP	DUP-RER	12/17/20			15	1.8	2.3	11	1.7	2.4				1.62	2	
L62871-03DUP	DUP-RPD	12/17/20			15	1.8	2.3	11	1.7	2.4				31	20	RM

**Polonium 210, dissolved**

HASL Po-01-RC

Units: pCi/L

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Error	LLD	Found	Error	LLD	Rec%	Lower	Upper	RPD/RER	Limit	Qual
<b>WG512249</b>																
WG512249PBW	PBW	01/04/21						1.09	2.6	4.6			9.2			
WG512249LCSW	LCSW	01/04/21	PCN59630	500				384	65	3.8	77	51	128			
L62226-03DUP	DUP-RER	01/04/21			1.96	2.6	4.4	.807	2.7	4.9				0.31	2	
L62226-03DUP	DUP-RPD	01/04/21			1.96	2.6	4.4	.807	2.7	4.9				83	20	RG
L62871-02MS	MS	01/04/21	PCN59630	500	-2.41	2.3	4.9	415	70	4.3	83	51	128			

**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>WG510599</b>																
WG510599PBW	PBW	12/15/20						.08	0.07	0.05			0.1			
WG510599LCSW	LCSW	12/15/20	PCN61539	20				14	0.46	0.1	70	43	148			
L62865-01DUP	DUP-RPD	12/15/20			0	0.25	0.34	.13	0.17	0.19				200	20	RG
L62865-01DUP	DUP-RER	12/15/20			0	0.25	0.34	.13	0.17	0.19				0.43	2	N1A
L62922-05DUP	DUP-RER	12/15/20			0.04	0.1	0.16	.11	0.07	0.05				0.57	2	
L62922-05DUP	DUP-RPD	12/15/20			0.04	0.1	0.16	.11	0.07	0.05				93	20	RG
L62865-02MS	MS	12/15/20	PCN61539	20	0.07	0.09	0.09	17	0.46	0.04	85	43	148			

Rio Algom Mining Company

ACZ Project ID: **L62871**

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>WG510367</b>																
WG510367LCSW	LCSW	12/10/20	PCN61541	9.42				7.8	1.1	1.9	83	47	123			
L62843-01DUP	DUP-RER	12/10/20			0.87	1.2	3	.19	0.79	1.8				0.47	2	
L62843-03MS	MS	12/10/20	PCN61541	9.42	0.44	0.98	2.1	7.5	1.2	2.3	75	47	123			
WG510367PBW	PBW	12/10/20						1.4	0.76	1.7			3.4			
L62843-01DUP	DUP-RPD	12/10/20			0.87	1.2	3	.19	0.79	1.8				128	20	RG
L62922-02DUP	DUP-RPD	12/10/20			1.1	1.2	2.8	-.22	0.96	2.1				300	20	RG
L62922-02DUP	DUP-RER	12/10/20			1.1	1.2	2.8	-.22	0.96	2.1				0.86	2	

**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>WG510549</b>																
WG510549LCSW	LCSW	12/03/20	PCN58726	200				191	28	0.77	96	91	126			
L62986-02DUP	DUP-RPD	12/04/20			0.186	0.31	0.55	-.0192	0.26	0.53				246	20	RG
L62986-02DUP	DUP-RER	12/04/20			0.186	0.31	0.55	-.0192	0.26	0.53				0.51	2	
L62871-01DUP	DUP-RER	12/04/20			0.358	0.31	0.46	.248	0.46	0.82				0.2	2	
L62986-08MS	MS	12/04/20	PCN58726	400	0.297	0.28	0.42	380	51	0.51	95	91	126			
L62871-01DUP	DUP-RPD	12/04/20			0.358	0.31	0.46	.248	0.46	0.82				36	20	RG
WG510549PBW	PBW	12/04/20						.0074	0.39	0.75			1.5			

Rio Algom Mining Company

ACZ Project ID: **L62871**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
<b>L62871-01</b>	WG510456	Lead 210, dissolved	EICHROM, OTW01	RM	For a water matrix, the duplicate precision assessment (RPD or RER) exceeded the control limit. High sediment, turbidity, or presence of an immiscible liquid attributed to non-homogeneity of the sample.
	WG512249	Polonium 210, dissolved	HASL Po-01-RC	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.
	WG510599	Radium 226, dissolved	M903.1	N1	See Case Narrative.
			M903.1	N1A	See Case Narrative.
	M903.1	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.		
WG510367	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.	
WG510549	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.	
<b>L62871-02</b>	WG510456	Lead 210, dissolved	EICHROM, OTW01	RM	For a water matrix, the duplicate precision assessment (RPD or RER) exceeded the control limit. High sediment, turbidity, or presence of an immiscible liquid attributed to non-homogeneity of the sample.
	WG512249	Polonium 210, dissolved	HASL Po-01-RC	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.
	WG510599	Radium 226, dissolved	M903.1	N1A	See Case Narrative.
			M903.1	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.
	WG510367	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.
WG510549	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.	
<b>L62871-03</b>	WG510456	Lead 210, dissolved	EICHROM, OTW01	RM	For a water matrix, the duplicate precision assessment (RPD or RER) exceeded the control limit. High sediment, turbidity, or presence of an immiscible liquid attributed to non-homogeneity of the sample.
	WG512249	Polonium 210, dissolved	HASL Po-01-RC	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.
	WG510599	Radium 226, dissolved	M903.1	DJ	Sample dilution required due to insufficient sample.
			M903.1	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.
	WG510367	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.
WG510549	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.	



Rio Algom Mining Company

ACZ Project ID: **L62871**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
<b>L62871-04</b>	WG510456	Lead 210, dissolved	EICHROM, OTW01	RM	For a water matrix, the duplicate precision assessment (RPD or RER) exceeded the control limit. High sediment, turbidity, or presence of an immiscible liquid attributed to non-homogeneity of the sample.
	WG512249	Polonium 210, dissolved	HASL Po-01-RC	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.
	WG510599	Radium 226, dissolved	M903.1	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.
	WG510367	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.
	WG510549	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.
<b>L62871-05</b>	WG510456	Lead 210, dissolved	EICHROM, OTW01	RM	For a water matrix, the duplicate precision assessment (RPD or RER) exceeded the control limit. High sediment, turbidity, or presence of an immiscible liquid attributed to non-homogeneity of the sample.
	WG512249	Polonium 210, dissolved	HASL Po-01-RC	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.
	WG510599	Radium 226, dissolved	M903.1 M903.1	DJ RG	Sample dilution required due to insufficient sample. 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.
	WG510367	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.
	WG510549	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.

**Rio Algom Mining Company**

ACZ Project ID: **L62871**

Radiochemistry

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

Lead 210, dissolved	EICHROM, OTW01
Polonium 210, dissolved	HASL Po-01-RC
Thorium 230, dissolved	ESM 4506

Rio Algom Mining Company  
 4508122295

ACZ Project ID: L62871  
 Date Received: 11/14/2020 12:40  
 Received By:  
 Date Printed: 11/17/2020

**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? L62871-03 Container B2349993 (GREEN CUBE): The ID on the sample label is 30-04 TRA, and on the COC the ID is 30-05 TRA. The sample ID was entered per the COC.		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?
6681	11.1	<=6.0	15	Yes
6096	2.9	<=6.0	21	Yes
6111	10.8	<=6.0	15	Yes

Was ice present in the shipment container(s)?

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

Rio Algom Mining Company  
4508122295

ACZ Project ID: L62871  
Date Received: 11/14/2020 12:40  
Received By:  
Date Printed: 11/17/2020

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. L62871

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 Attached Note Sheet, Company: INTERA, INC., E-mail: See Attached Note Sheet, 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. Williamson, 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 12 analysis columns. Includes handwritten entries for samples 30-96 IRB, 03-69 IRB, 30-05 TRA, 30-07 KD, 31-03 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#: 20-67. Note different COC's may have different PO's. Shipment of 4 Coolers.

See Attached Note Sheet

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 handwritten signatures and dates.

FRMAD050.06.14.14

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

L62871 Chain of Custody

**Notes:**

Coolers with samples that need to be maintained at  $<6^{\circ}\text{C}$  are marked with the sticker "**CHILL**"

Coolers with samples that do not need to be maintained at  $<6^{\circ}\text{C}$  are marked with the sticker "**AMBIENT TEMP**"

**Please CC reports to:** [cshort@interacom](mailto:cshort@interacom), [apersico@interacom](mailto:apersico@interacom), [Michaella.Gorospe@bhpbilliton.com](mailto:Michaella.Gorospe@bhpbilliton.com), [jcarroll@interacom](mailto:jcarroll@interacom)

**Please CC sample receipt documents to:** [cshort@interacom](mailto:cshort@interacom), [Michaella.Gorospe@bhpbilliton.com](mailto:Michaella.Gorospe@bhpbilliton.com), [bwilliamson@interacom](mailto:bwilliamson@interacom), [jstakutis@interacom](mailto:jstakutis@interacom)

**Return empty coolers to:**

Bryce Williamson

7609 Euclid Ave NE,

Albuquerque, NM, 87110

**If there are any issues with the samples or shipping please contact:**

Clark Short

[cshort@interacom](mailto:cshort@interacom)

412-304-5499

Bryce Williamson

[bwilliamson@interacom](mailto:bwilliamson@interacom)

385-722-6707