

March 15, 2018

## 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, Michaela Gorospe

Project ID: 4502696253

ACZ Project ID: L42852

## Kent Applegate:

Enclosed are the analytical results for sample(s) submitted to ACZ Laboratories, Inc. (ACZ) on February 24, 2018. This project has been assigned to ACZ's project number, L42852. 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 L42852. 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 14, 2018. 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.



Sue Webber has reviewed and  
approved this report.



**Rio Algom Mining Company**

Project ID: 4502696253

Sample ID: 32-59 ALL

ACZ Sample ID: **L42852-01**

Date Sampled: 02/23/18 10:36

Date Received: 02/24/18

Sample Matrix: Ground Water

## Metals Analysis

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	2	452		*	mg/L	0.2	1	03/01/18 16:25	aeh
Iron, dissolved	M200.7 ICP	2		U		mg/L	0.04	0.1	03/01/18 16:25	aeh
Magnesium, dissolved	M200.7 ICP	2	204			mg/L	0.4	2	03/01/18 16:25	aeh
Molybdenum, dissolved	M200.8 ICP-MS	5	0.005	B		mg/L	0.003	0.01	03/05/18 13:42	msh
Nickel, dissolved	M200.8 ICP-MS	5		U		mg/L	0.003	0.02	03/05/18 13:42	msh
Potassium, dissolved	M200.7 ICP	2	1.5	B		mg/L	0.4	2	03/01/18 16:25	aeh
Selenium, dissolved	SM 3114 B, AA-Hydride	5	0.0642		*	mg/L	0.005	0.025	02/28/18 15:37	sck
Sodium, dissolved	M200.7 ICP	2	488			mg/L	0.4	2	03/01/18 16:25	aeh
Uranium, dissolved	M200.8 ICP-MS	5	0.156			mg/L	0.0005	0.003	03/05/18 13:42	msh

## Wet Chemistry

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO <sub>3</sub>	SM2320B - Titration									
Bicarbonate as CaCO <sub>3</sub>		1	271			mg/L	2	20	02/27/18 0:00	ecc
Carbonate as CaCO <sub>3</sub>		1		U		mg/L	2	20	02/27/18 0:00	ecc
Hydroxide as CaCO <sub>3</sub>		1		U		mg/L	2	20	02/27/18 0:00	ecc
Total Alkalinity		1	271			mg/L	2	20	02/27/18 0:00	ecc
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-8.3			%			03/15/18 0:00	calc
Sum of Anions			72			meq/L			03/15/18 0:00	calc
Sum of Cations			61			meq/L			03/15/18 0:00	calc
Chloride	SM4500Cl-E	10	448			mg/L	5	20	02/27/18 12:37	kea
Conductivity @25C	SM2510B	1	4980			umhos/cm	1	10	02/27/18 19:40	ecc
Nitrate/Nitrite as N	M353.2 - H <sub>2</sub> SO <sub>4</sub> preserved	1	2.34		*	mg/L	0.02	0.1	03/06/18 22:43	pjb
Residue, Filterable (TDS) @180C	SM2540C	2	4750			mg/L	20	40	03/01/18 8:43	mh
Sulfate	D516-02/-07 - Turbidimetric	100	2550		*	mg/L	100	500	02/26/18 12:46	kea
TDS (calculated)	Calculation		4310			mg/L			03/15/18 0:00	calc
TDS (ratio - measured/calculated)	Calculation		1.10						03/15/18 0:00	calc

**Rio Algom Mining Company**

Project ID: 4502696253

Sample ID: 5-03 ALL

ACZ Sample ID: **L42852-02**

Date Sampled: 02/23/18 11:45

Date Received: 02/24/18

Sample Matrix: Ground Water

**Metals Analysis**

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	2	491		*	mg/L	0.2	1	03/01/18 16:29	aeh
Iron, dissolved	M200.7 ICP	2		U		mg/L	0.04	0.1	03/01/18 16:29	aeh
Magnesium, dissolved	M200.7 ICP	2	264			mg/L	0.4	2	03/01/18 16:29	aeh
Molybdenum, dissolved	M200.8 ICP-MS	5		U		mg/L	0.003	0.01	03/05/18 13:45	msh
Nickel, dissolved	M200.8 ICP-MS	5	0.003	B		mg/L	0.003	0.02	03/05/18 13:45	msh
Potassium, dissolved	M200.7 ICP	2	3.5			mg/L	0.4	2	03/01/18 16:29	aeh
Selenium, dissolved	SM 3114 B, AA-Hydride	1		U	*	mg/L	0.001	0.005	02/28/18 15:22	sck
Sodium, dissolved	M200.7 ICP	2	408			mg/L	0.4	2	03/01/18 16:29	aeh
Uranium, dissolved	M200.8 ICP-MS	5	0.0964			mg/L	0.0005	0.003	03/05/18 13:45	msh

**Wet Chemistry**

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO <sub>3</sub>	SM2320B - Titration									
Bicarbonate as CaCO <sub>3</sub>		1	301			mg/L	2	20	02/27/18 0:00	ecc
Carbonate as CaCO <sub>3</sub>		1		U		mg/L	2	20	02/27/18 0:00	ecc
Hydroxide as CaCO <sub>3</sub>		1		U		mg/L	2	20	02/27/18 0:00	ecc
Total Alkalinity		1	301			mg/L	2	20	02/27/18 0:00	ecc
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-3.8			%			03/15/18 0:00	calc
Sum of Anions			69			meq/L			03/15/18 0:00	calc
Sum of Cations			64			meq/L			03/15/18 0:00	calc
Chloride	SM4500Cl-E	10	583			mg/L	5	20	02/27/18 12:37	kea
Conductivity @25C	SM2510B	1	4940			umhos/cm	1	10	02/27/18 19:49	ecc
Nitrate/Nitrite as N	M353.2 - H <sub>2</sub> SO <sub>4</sub> preserved	1	0.43		*	mg/L	0.02	0.1	03/06/18 22:45	pjb
Residue, Filterable (TDS) @180C	SM2540C	2	4290			mg/L	20	40	03/01/18 8:46	mh
Sulfate	D516-02/-07 - Turbidimetric	100	2240		*	mg/L	100	500	02/26/18 12:49	kea
TDS (calculated)	Calculation		4170			mg/L			03/15/18 0:00	calc
TDS (ratio - measured/calculated)	Calculation		1.03						03/15/18 0:00	calc

**Rio Algom Mining Company**

Project ID: 4502696253

Sample ID: 5-30 ALL

ACZ Sample ID: **L42852-03**

Date Sampled: 02/23/18 13:00

Date Received: 02/24/18

Sample Matrix: Ground Water

**Metals Analysis**

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	2	508		*	mg/L	0.2	1	03/01/18 16:32	aeh
Iron, dissolved	M200.7 ICP	2		U		mg/L	0.04	0.1	03/01/18 16:32	aeh
Magnesium, dissolved	M200.7 ICP	2	272			mg/L	0.4	2	03/01/18 16:32	aeh
Molybdenum, dissolved	M200.8 ICP-MS	5		U		mg/L	0.003	0.01	03/05/18 13:49	msh
Nickel, dissolved	M200.8 ICP-MS	5	0.003	B		mg/L	0.003	0.02	03/05/18 13:49	msh
Potassium, dissolved	M200.7 ICP	2	3.6			mg/L	0.4	2	03/01/18 16:32	aeh
Selenium, dissolved	SM 3114 B, AA-Hydride	1		U	*	mg/L	0.001	0.005	02/28/18 15:24	sck
Sodium, dissolved	M200.7 ICP	2	424			mg/L	0.4	2	03/01/18 16:32	aeh
Uranium, dissolved	M200.8 ICP-MS	5	0.0972			mg/L	0.0005	0.003	03/05/18 13:49	msh

**Wet Chemistry**

Parameter	EPA Method	Dilution	Result	Qual	XQ	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO <sub>3</sub>	SM2320B - Titration									
Bicarbonate as CaCO <sub>3</sub>		1	316			mg/L	2	20	02/27/18 0:00	ecc
Carbonate as CaCO <sub>3</sub>		1		U		mg/L	2	20	02/27/18 0:00	ecc
Hydroxide as CaCO <sub>3</sub>		1		U		mg/L	2	20	02/27/18 0:00	ecc
Total Alkalinity		1	316			mg/L	2	20	02/27/18 0:00	ecc
Cation-Anion Balance	Calculation									
Cation-Anion Balance			-2.2			%			03/15/18 0:00	calc
Sum of Anions			70			meq/L			03/15/18 0:00	calc
Sum of Cations			67			meq/L			03/15/18 0:00	calc
Chloride	SM4500Cl-E	10	572			mg/L	5	20	02/27/18 12:37	kea
Conductivity @25C	SM2510B	1	4960			umhos/cm	1	10	02/27/18 19:59	ecc
Nitrate/Nitrite as N	M353.2 - H <sub>2</sub> SO <sub>4</sub> preserved	1	0.44			mg/L	0.02	0.1	03/06/18 22:47	pjb
Residue, Filterable (TDS) @180C	SM2540C	2	4350			mg/L	20	40	03/01/18 8:48	mh
Sulfate	D516-02/-07 - Turbidimetric	100	2280		*	mg/L	100	500	02/26/18 12:50	kea
TDS (calculated)	Calculation		4250			mg/L			03/15/18 0:00	calc
TDS (ratio - measured/calculated)	Calculation		1.02						03/15/18 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:

<http://www.acz.com/public/extquallist.pdf>

Rio Algom Mining Company

ACZ Project ID: **L42852**

**Alkalinity as CaCO3**

SM2320B - Titration

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG442575</b>													
WG442575PBW1	PBW	02/27/18 15:59				2.6	mg/L		-20	20			
WG442575LCSW3	LCSW	02/27/18 16:14	WC180216-2	820.0001		781	mg/L	95	90	110			
WG442575LCSW6	LCSW	02/27/18 18:58	WC180216-2	820.0001		804	mg/L	98	90	110			
WG442575PBW2	PBW	02/27/18 19:05				3.4	mg/L		-20	20			
L42857-01DUP	DUP	02/27/18 20:24			303	303	mg/L				0	20	
WG442575LCSW9	LCSW	02/27/18 21:38	WC180216-2	820.0001		795	mg/L	97	90	110			
WG442575PBW3	PBW	02/27/18 21:44				2.6	mg/L		-20	20			
WG442575LCSW12	LCSW	02/28/18 0:53	WC180216-2	820.0001		752	mg/L	92	90	110			
WG442575PBW4	PBW	02/28/18 1:00				2.7	mg/L		-20	20			
WG442575LCSW15	LCSW	02/28/18 2:30	WC180216-2	820.0001		817	mg/L	100	90	110			

**Calcium, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG442711</b>													
WG442711ICV	ICV	03/01/18 14:47	II180208-1	100		99.64	mg/L	100	95	105			
WG442711ICB	ICB	03/01/18 14:54				U	mg/L		-0.3	0.3			
WG442711LFB	LFB	03/01/18 15:07	II180228-3	68.03333		69.8	mg/L	103	85	115			
L42797-02AS	AS	03/01/18 16:09	II180228-3	68.03333	305	358.6	mg/L	79	85	115			M3
L42797-02ASD	ASD	03/01/18 16:12	II180228-3	68.03333	305	355.9	mg/L	75	85	115	1	20	M3

**Chloride**

SM4500Cl-E

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG442553</b>													
WG442553ICB	ICB	02/27/18 11:23				U	mg/L		-1.5	1.5			
WG442553ICV	ICV	02/27/18 11:23	WI170807-5	55.165		59.99	mg/L	109	90	110			
WG442553LFB	LFB	02/27/18 12:28	WI171229-5	30.03		31.78	mg/L	106	90	110			
L42828-02AS	AS	02/27/18 12:28	WI171229-5	30.03	U	31.87	mg/L	106	90	110			
L42833-01DUP	DUP	02/27/18 12:28			57.5	57.45	mg/L				0	20	

**Conductivity @25C**

SM2510B

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG442575</b>													
WG442575LCSW2	LCSW	02/27/18 16:03	PCN55151	1410		1460	umhos/cm	104	90	110			
WG442575LCSW5	LCSW	02/27/18 18:46	PCN55151	1410		1440	umhos/cm	102	90	110			
L42857-01DUP	DUP	02/27/18 20:24			3310	3320	umhos/cm				0	20	
WG442575LCSW8	LCSW	02/27/18 21:27	PCN55151	1410		1420	umhos/cm	101	90	110			
WG442575LCSW11	LCSW	02/28/18 0:42	PCN55151	1410		1330	umhos/cm	94	90	110			
WG442575LCSW14	LCSW	02/28/18 2:18	PCN55151	1410		1340	umhos/cm	95	90	110			

**Iron, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG442711</b>													
WG442711ICV	ICV	03/01/18 14:47	II180208-1	2		1.939	mg/L	97	95	105			
WG442711ICB	ICB	03/01/18 14:54				U	mg/L		-0.06	0.06			
WG442711LFB	LFB	03/01/18 15:07	II180228-3	1.0011		1.006	mg/L	100	85	115			
L42797-02AS	AS	03/01/18 16:09	II180228-3	1.0011	U	.963	mg/L	96	85	115			
L42797-02ASD	ASD	03/01/18 16:12	II180228-3	1.0011	U	.963	mg/L	96	85	115	0	20	

Rio Algom Mining Company

ACZ Project ID: **L42852**

**Magnesium, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG442711</b>													
WG442711ICV	ICV	03/01/18 14:47	II180208-1	100		99.63	mg/L	100	95	105			
WG442711ICB	ICB	03/01/18 14:54				U	mg/L		-0.6	0.6			
WG442711LFB	LFB	03/01/18 15:07	II180228-3	50.05743		47.45	mg/L	95	85	115			
L42797-02AS	AS	03/01/18 16:09	II180228-3	50.05743	61.3	104.9	mg/L	87	85	115			
L42797-02ASD	ASD	03/01/18 16:12	II180228-3	50.05743	61.3	104.3	mg/L	86	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>WG442858</b>													
WG442858ICV	ICV	03/05/18 12:46	MS180219-2	.02006		.0195	mg/L	97	90	110			
WG442858ICB	ICB	03/05/18 12:49				U	mg/L		-0.0015	0.0015			
WG442858LFB	LFB	03/05/18 12:52	MS180302-2	.0501		.0483	mg/L	96	85	115			
L42852-03AS	AS	03/05/18 13:52	MS180302-2	.2505	U	.2415	mg/L	96	70	130			
L42852-03ASD	ASD	03/05/18 13:55	MS180302-2	.2505	U	.2418	mg/L	97	70	130	0	20	

**Nickel, dissolved**

M200.8 ICP-MS

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG442858</b>													
WG442858ICV	ICV	03/05/18 12:46	MS180219-2	.05		.05197	mg/L	104	90	110			
WG442858ICB	ICB	03/05/18 12:49				U	mg/L		-0.0018	0.0018			
WG442858LFB	LFB	03/05/18 12:52	MS180302-2	.0501		.0483	mg/L	96	85	115			
L42852-03AS	AS	03/05/18 13:52	MS180302-2	.2505	.003	.2155	mg/L	85	70	130			
L42852-03ASD	ASD	03/05/18 13:55	MS180302-2	.2505	.003	.2196	mg/L	86	70	130	2	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>WG442969</b>													
WG442969ICV	ICV	03/06/18 21:28	WI180301-7	2.416		2.388	mg/L	99	90	110			
WG442969ICB	ICB	03/06/18 21:29				U	mg/L		-0.02	0.02			
WG442969LFB1	LFB	03/06/18 22:07	WI180103-12	2		1.977	mg/L	99	90	110			
L42843-01AS	AS	03/06/18 22:28	WI180103-12	2	U	.406	mg/L	20	90	110			M2
WG442969LFB2	LFB	03/06/18 22:46	WI180103-12	2		1.869	mg/L	93	90	110			
L42852-03AS	AS	03/06/18 22:48	WI180103-12	2	.44	2.513	mg/L	104	90	110			
L42843-02DUP	DUP	03/06/18 23:00			5.62	5.632	mg/L				0	20	
L42853-01DUP	DUP	03/06/18 23:05			28.1	28.1	mg/L				0	20	

**Potassium, dissolved**

M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG442711</b>													
WG442711ICV	ICV	03/01/18 14:47	II180208-1	20		20.01	mg/L	100	95	105			
WG442711ICB	ICB	03/01/18 14:54				U	mg/L		-0.6	0.6			
WG442711LFB	LFB	03/01/18 15:07	II180228-3	100.0094		100.4	mg/L	100	85	115			
L42797-02AS	AS	03/01/18 16:09	II180228-3	100.0094	2.4	102.8	mg/L	100	85	115			
L42797-02ASD	ASD	03/01/18 16:12	II180228-3	100.0094	2.4	103	mg/L	101	85	115	0	20	

Rio Algom Mining Company

ACZ Project ID: **L42852**

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

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG442684</b>													
WG442684PBW	PBW	03/01/18 8:34				10	mg/L		-20	20			
WG442684LCSW	LCSW	03/01/18 8:36	PCN55381	260		260	mg/L	100	80	120			
L42893-03DUP	DUP	03/01/18 9:03			2970	2900	mg/L				2	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>WG442488</b>													
WG442488ICV	ICV	02/28/18 13:50	SE180226-2	.025025		.0245	mg/L	98	90	110			
WG442488ICB	ICB	02/28/18 13:52				U	mg/L		-0.003	0.003			
<b>WG442489</b>													
WG442489LRB	LRB	02/28/18 15:06				U	mg/L		-0.003	0.003			
WG442489LFB	LFB	02/28/18 15:08	SE180226-4	.02224		.0212	mg/L	95	85	115			
L42852-01LFM	LFM	02/28/18 15:39	SE180226-4	.02224	.0642	.0823	mg/L	81	85	115			M2
L42852-01LFMD	LFMD	02/28/18 15:41	SE180226-4	.02224	.0642	.0817	mg/L	79	85	115	1	20	M2

**Sodium, dissolved** M200.7 ICP

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG442711</b>													
WG442711ICV	ICV	03/01/18 14:47	II180208-1	100		100.48	mg/L	100	95	105			
WG442711ICB	ICB	03/01/18 14:54				U	mg/L		-0.6	0.6			
WG442711LFB	LFB	03/01/18 15:07	II180228-3	100.0062		101.1	mg/L	101	85	115			
L42797-02AS	AS	03/01/18 16:09	II180228-3	100.0062	6.9	107.9	mg/L	101	85	115			
L42797-02ASD	ASD	03/01/18 16:12	II180228-3	100.0062	6.9	108.1	mg/L	101	85	115	0	20	

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

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG442470</b>													
WG442470ICB	ICB	02/26/18 10:08				1.2	mg/L		-3	3			
WG442470ICV	ICV	02/26/18 10:08	WI180222-2	20		20	mg/L	100	90	110			
WG442470LFB	LFB	02/26/18 12:18	WI171212-5	10		9.5	mg/L	95	90	110			
L42852-01AS	AS	02/26/18 12:49	WI171212-5	1000	2550	2440	mg/L	-11	90	110			M3
L42852-02DUP	DUP	02/26/18 12:49			2240	2160	mg/L				4	20	

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

ACZ ID	Type	Analyzed	PCN/SCN	QC	Sample	Found	Units	Rec	Lower	Upper	RPD	Limit	Qual
<b>WG442858</b>													
WG442858ICV	ICV	03/05/18 12:46	MS180219-2	.05		.05253	mg/L	105	90	110			
WG442858ICB	ICB	03/05/18 12:49				U	mg/L		-0.0003	0.0003			
WG442858LFB	LFB	03/05/18 12:52	MS180302-2	.05		.04996	mg/L	100	85	115			
L42852-03AS	AS	03/05/18 13:52	MS180302-2	.25	.0972	.35755	mg/L	104	70	130			
L42852-03ASD	ASD	03/05/18 13:55	MS180302-2	.25	.0972	.3585	mg/L	105	70	130	0	20	



Rio Algom Mining Company

ACZ Project ID: **L42852**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
<b>L42852-01</b>	WG442711	Calcium, dissolved	M200.7 ICP	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.
	WG442969	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG442489	Selenium, dissolved	SM 3114 B, AA-Hydride	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG442470	Sulfate	D516-02/-07 - 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.
<b>L42852-02</b>	WG442711	Calcium, dissolved	M200.7 ICP	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.
	WG442969	Nitrate/Nitrite as N	M353.2 - H2SO4 preserved	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG442489	Selenium, dissolved	SM 3114 B, AA-Hydride	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG442470	Sulfate	D516-02/-07 - 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.
<b>L42852-03</b>	WG442711	Calcium, dissolved	M200.7 ICP	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.
	WG442489	Selenium, dissolved	SM 3114 B, AA-Hydride	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
	WG442470	Sulfate	D516-02/-07 - 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.

**Rio Algom Mining Company**

Project ID: 4502696253

Sample ID: 32-59 ALL

Locator:

ACZ Sample ID: **L42852-01**

Date Sampled: 02/23/18 10:36

Date Received: 02/24/18

Sample Matrix: Ground Water

Gross Alpha, dissolved

Prep Method:

M9310

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha, dissolved	03/05/18 0:28		61	21	38	pCi/L	*	jljg

Lead 210, dissolved

Prep Method:

EICHROM, OTW01

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Lead 210, dissolved	03/07/18 15:50		4.4	1.3	3.2	pCi/L	*	jljg

Radium 226, dissolved

Prep Method:

M903.1

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226, dissolved	03/13/18 0:27		0.14	0.08	0.06	pCi/L		leb

Radium 228, dissolved

Prep Method:

M9320

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228, dissolved	03/06/18 16:32		0.17	0.62	0.65	pCi/L		gjb

Thorium 230, dissolved

Prep Method:

ESM 4506

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Thorium 230, dissolved	03/09/18 0:20		-0.17	0.38	0.64	pCi/L	*	djc

**Rio Algom Mining Company**

Project ID: 4502696253

Sample ID: 5-03 ALL

Locator:

ACZ Sample ID: **L42852-02**

Date Sampled: 02/23/18 11:45

Date Received: 02/24/18

Sample Matrix: Ground Water

Gross Alpha, dissolved

Prep Method:

M9310

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha, dissolved	03/05/18 0:30		35	19	40	pCi/L	*	jljg

Lead 210, dissolved

Prep Method:

EICHROM, OTW01

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Lead 210, dissolved	03/07/18 15:50		3.4	1.3	3.2	pCi/L	*	jljg

Radium 226, dissolved

Prep Method:

M903.1

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226, dissolved	03/13/18 0:28		0.18	0.1	0.08	pCi/L		leb

Radium 228, dissolved

Prep Method:

M9320

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228, dissolved	03/06/18 16:32		-0.15	0.62	0.67	pCi/L		gjb

Thorium 230, dissolved

Prep Method:

ESM 4506

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Thorium 230, dissolved	03/09/18 0:21		0.07	0.26	0.59	pCi/L	*	djc

**Rio Algom Mining Company**

Project ID: 4502696253

Sample ID: 5-30 ALL

Locator:

ACZ Sample ID: **L42852-03**

Date Sampled: 02/23/18 13:00

Date Received: 02/24/18

Sample Matrix: Ground Water

Gross Alpha, dissolved

Prep Method:

M9310

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Gross Alpha, dissolved	03/05/18 0:31		57	23	25	pCi/L	*	jljg

Lead 210, dissolved

Prep Method:

EICHROM, OTW01

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Lead 210, dissolved	03/07/18 15:50		3.8	1.4	3.4	pCi/L	*	jljg

Radium 226, dissolved

Prep Method:

M903.1

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 226, dissolved	03/13/18 0:30		0.1	0.09	0.06	pCi/L		leb

Radium 228, dissolved

Prep Method:

M9320

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Radium 228, dissolved	03/06/18 16:32		0.55	0.77	0.78	pCi/L		gjb

Thorium 230, dissolved

Prep Method:

ESM 4506

Parameter	Measure Date	Prep Date	Result	Error(+/-)	LLD	Units	XQ	Analyst
Thorium 230, dissolved	03/09/18 0:23		-0.17	0.25	0.63	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:

<http://www.acz.com/public/extquallist.pdf>

Rio Algom Mining Company

ACZ Project ID: **L42852**

**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>WG442898</b>																
WG442519PBW	PBW	03/05/18						-.37	0.62	1			2			
WG442519LCSW	LCSW	03/05/18	RC180131-1	100				100	8.7	1.6	100	67	144			
L42782-02DUP	DUP-RER	03/05/18			1.2	1.4	8.3	.11	1.2	6.5				0.59	2	
L42782-11DUP	DUP-RER	03/05/18			3.6	2.2	9.7	4.9	2.6	7.8				0.38	2	
L42782-06MS	MS	03/05/18	RC180131-1	100	2.1	2.2	7.7	67	9.4	14	65	67	144			M2

**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>WG442917</b>																
WG442538LCSW	LCSW	03/07/18	PCN54283	98.33				110	3.3	3.1	112	55	121			
WG442538PBW	PBW	03/07/18						2.5	1.1	2.8			5.6			
L42700-02DUP	DUP-RER	03/07/18			4	1.3	3.1	2.1	1.3	3.3				1.03	2	
L42700-05MS	MS	03/07/18	PCN54283	98.33	1.7	1.5	4	93	3.1	3.5	93	55	121			
L42852-02DUP	DUP-RER	03/07/18			3.4	1.3	3.2	2.3	1.4	3.6				0.58	2	

**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>WG443403</b>																
WG442568PBW	PBW	03/13/18						.09	0.08	0.06			0.12			
WG442568LCSW	LCSW	03/13/18	PCN54812	20				24	0.65	0.06	120	43	148			
L42758-04DUP	DUP-RER	03/13/18			0.71	0.27	0.59	.47	0.2	0.11				0.71	2	
L42758-12DUP	DUP-RER	03/13/18			0.27	0.12	0.26	.51	0.18	0.11				1.11	2	
L42782-07MS	MS	03/13/18	PCN54812	50	0.07	0.07	0.07	53	1.5	0.26	106	43	148			

Rio Algom Mining Company

ACZ Project ID: **L42852**

**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>WG442984</b>																
WG442648LCSW	LCSW	03/06/18	PCN53179	8.9				10	1.3	0.8	112	47	123			
WG442648PBW	PBW	03/06/18						-39	0.69	0.76			1.52			
L42744-02DUP	DUP-RER	03/06/18			0.38	0.78	0.81	-22	0.67	0.73				0.58	2	
L42852-02DUP	DUP-RER	03/06/18			-0.15	0.62	0.67	-21	0.53	0.58				0.07	2	
L42852-03MS	MS	03/06/18	PCN53179	9.09	0.55	0.77	0.78	4.8	1.3	1.1	47	47	123			

**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>WG443276</b>																
WG442483PBW	PBW	03/09/18						-33	0.19	0.57			1.14			
WG442483LCSW	LCSW	03/09/18	PCN52270	200				200	5.2	0.71	100	91	126			
L42700-03DUP	DUP-RER	03/09/18			0.03	0.22	0.58	-12	0.2	0.63				0.5	2	
L42852-01DUP	DUP-RER	03/09/18			-0.17	0.38	0.64	-13	0.49	0.68				0.06	2	
L42846-03MS	MS	03/09/18	PCN52270	200	-0.11	0.25	0.58	190	4.9	0.63	95	91	126			

**Rio Algom Mining Company**

ACZ Project ID: **L42852**

ACZ ID	WORKNUM	PARAMETER	METHOD	QUAL	DESCRIPTION
L42852-01	WG442898	Gross Alpha, dissolved	M9310	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L42852-02	WG442898	Gross Alpha, dissolved	M9310	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.
L42852-03	WG442898	Gross Alpha, dissolved	M9310	M2	Matrix spike recovery was low, the recovery of the associated control sample (LCS or LFB) was acceptable.



**Rio Algom Mining Company**

ACZ Project ID: **L42852**

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**  
4502696253

ACZ Project ID: L42852  
Date Received: 02/24/2018 10:34  
Received By:  
Date Printed: 2/26/2018

### 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		
A change was made in the Copy of Report to Name. Invoice to Name. Email section prior to ACZ custody.			

### 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?
3354	12.2	NA	14	Yes
NA27895	3.2	<=6.0	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**  
4502696253

ACZ Project ID: L42852  
Date Received: 02/24/2018 10:34  
Received By:  
Date Printed: 2/26/2018

<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).

**ACZ****Laboratories, Inc.**

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

CHAIN of CUSTODY

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: Clark Short/Angie Persico (both) *Michaela Givodspe*

Company: INTERA, INC.

E-mail: cshort@intera.com/apersico@intera.com

Telephone: 505-246-1600 x1207

Invoice to:

Name: ~~Gail Alexander~~ Kent Applegate

Company: Rio Algom Mining LLC

E-mail: ~~Gail Alexander~~@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: *Jana Tanka* Sampler's Site Information State NM Zip code 87020 Time Zone MSTSampler's Signature: *Jana Tanka*

\*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

Quote #: 58714PO#: 4502696253

Reporting state for compliance testing:

Check box if samples include NRC licensed material? ☐

SAMPLE IDENTIFICATION DATE:TIME Matrix

32-59 ALL 2/23/18 1036 GW

S-03 ALL-R 2/23/18 1145 GW

S-30 ALL-R 2/23/18 1300 GW

# of Containers

SAP-GW

NRC-AU

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

## REMARKS

RAML COC#: 17-44 Note different COC's may have different PO's. Shipment of 2 Coolers.

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

RELINQUISHED BY:

DATE:TIME

RECEIVED BY:

DATE:TIME

*Jana Tanka*

2/23/18 1100

*BCR*

2/24/18 1034

FRMAD050.06.14.14

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



L42852 Chain of Custody