Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: DR-4 **Date / Time Sampled:** 11/13/13 11:10 **Workorder:** C131107
EPA Tag No.: 8-B **Matrix:** Surface Water **Lab Number:** C131107-13 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	**Aluminum**	**451**	J	ug/L	200	10	12/10/2013	SV	1312035
200.7	Beryllium	< 50.0	U	ug/L	20.0	10	12/10/2013	SV	1312035
200.7	**Calcium**	**238000**		ug/L	500	10	12/10/2013	SV	1312035
200.7	**Iron**	**1910**	J	ug/L	1000	10	12/10/2013	SV	1312035
200.7	**Magnesium**	**20900**		ug/L	1000	10	12/10/2013	SV	1312035
200.7	**Manganese**	**1990**		ug/L	20.0	10	12/10/2013	SV	1312035
200.7	**Potassium**	**2790**	J	ug/L	2500	10	12/10/2013	SV	1312035
200.7	**Sodium**	**12200**		ug/L	2500	10	12/10/2013	SV	1312035
200.7	**Zinc**	**4840**		ug/L	100	10	12/10/2013	SV	1312035
200.8	Antimony	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Barium	< 100	U	ug/L	50.0	10	12/10/2013	SV	1312035
200.8	**Cadmium**	**26.0**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	Chromium	< 20.0	U	ug/L	10.0	10	12/10/2013	SV	1312035
200.8	**Cobalt**	**2.96**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Copper**	**31.8**		ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Lead**	**1.36**	J	ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Molybdenum**	**13.5**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	Nickel	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Selenium	< 20.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Silver	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Thallium	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Thorium	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Uranium**	**4.17**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	Vanadium	< 30.0	U	ug/L	20.0	10	12/10/2013	SV	1312035

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Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: DR-5 **Date / Time Sampled:** 11/13/13 15:10 **Workorder:** C131107
EPA Tag No.: 8-B **Matrix:** Surface Water **Lab Number:** C131107-15 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	**Aluminum**	**365**	J	ug/L	200	10	12/10/2013	SV	1312035
200.7	Beryllium	< 50.0	U	ug/L	20.0	10	12/10/2013	SV	1312035
200.7	**Calcium**	**237000**		ug/L	500	10	12/10/2013	SV	1312035
200.7	Iron	< 2500	U	ug/L	1000	10	12/10/2013	SV	1312035
200.7	**Magnesium**	**21500**		ug/L	1000	10	12/10/2013	SV	1312035
200.7	**Manganese**	**1790**		ug/L	20.0	10	12/10/2013	SV	1312035
200.7	**Potassium**	**3390**	J	ug/L	2500	10	12/10/2013	SV	1312035
200.7	**Sodium**	**12200**		ug/L	2500	10	12/10/2013	SV	1312035
200.7	**Zinc**	**4150**		ug/L	100	10	12/10/2013	SV	1312035
200.8	Antimony	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Barium	< 100	U	ug/L	50.0	10	12/10/2013	SV	1312035
200.8	**Cadmium**	**21.0**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	Chromium	< 20.0	U	ug/L	10.0	10	12/10/2013	SV	1312035
200.8	**Cobalt**	**2.11**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Copper**	**15.7**		ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Lead	< 2.00	U	ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Molybdenum**	**11.7**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	Nickel	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Selenium	< 20.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Silver	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Thallium	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Thorium	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Uranium**	**3.74**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	Vanadium	< 30.0	U	ug/L	20.0	10	12/10/2013	SV	1312035

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Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: DR-6 **Date / Time Sampled:** 11/13/13 14:08 **Workorder:** C131107
EPA Tag No.: 8-B **Matrix:** Surface Water **Lab Number:** C131107-17 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	**Aluminum**	**367**	J	ug/L	200	10	12/10/2013	SV	1312035
200.7	Beryllium	< 50.0	U	ug/L	20.0	10	12/10/2013	SV	1312035
200.7	**Calcium**	**255000**		ug/L	500	10	12/10/2013	SV	1312035
200.7	Iron	< 2500	U	ug/L	1000	10	12/10/2013	SV	1312035
200.7	**Magnesium**	**24800**		ug/L	1000	10	12/10/2013	SV	1312035
200.7	**Manganese**	**1670**		ug/L	20.0	10	12/10/2013	SV	1312035
200.7	**Potassium**	**4120**	J	ug/L	2500	10	12/10/2013	SV	1312035
200.7	**Sodium**	**14900**		ug/L	2500	10	12/10/2013	SV	1312035
200.7	**Zinc**	**3650**		ug/L	100	10	12/10/2013	SV	1312035
200.8	Antimony	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Arsenic	< 20.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Barium	< 100	U	ug/L	50.0	10	12/10/2013	SV	1312035
200.8	**Cadmium**	**17.1**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	Chromium	< 20.0	U	ug/L	10.0	10	12/10/2013	SV	1312035
200.8	**Cobalt**	**1.97**	J	ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Copper**	**6.45**	J	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Lead	< 2.00	U	ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Molybdenum**	**10.1**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	Nickel	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Selenium	< 20.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Silver	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Thallium	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Thorium	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Uranium**	**3.84**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	Vanadium	< 30.0	U	ug/L	20.0	10	12/10/2013	SV	1312035

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Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: DR-7 **Date / Time Sampled:** 11/13/13 12:56 **Workorder:** C131107
EPA Tag No.: 8-B **Matrix:** Surface Water **Lab Number:** C131107-20 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	**Aluminum**	**119**		ug/L	20.0	1	12/10/2013	SV	1312035
200.7	Beryllium	< 5.00	U	ug/L	2.00	1	12/10/2013	SV	1312035
200.7	**Calcium**	**61400**		ug/L	50.0	1	12/10/2013	SV	1312035
200.7	**Iron**	**168**	J	ug/L	100	1	12/10/2013	SV	1312035
200.7	**Magnesium**	**9030**		ug/L	100	1	12/10/2013	SV	1312035
200.7	**Manganese**	**189**		ug/L	2.00	1	12/10/2013	SV	1312035
200.7	**Potassium**	**1410**		ug/L	250	1	12/10/2013	SV	1312035
200.7	**Sodium**	**4800**		ug/L	250	1	12/10/2013	SV	1312035
200.7	**Zinc**	**172**		ug/L	10.0	1	12/10/2013	SV	1312035
200.8	Antimony	< 5.00	U	ug/L	2.50	5	12/10/2013	SV	1312035
200.8	Arsenic	< 10.0	U	ug/L	2.50	5	12/10/2013	SV	1312035
200.8	**Barium**	**65.6**		ug/L	25.0	5	12/10/2013	SV	1312035
200.8	**Cadmium**	**0.849**	J	ug/L	0.500	5	12/10/2013	SV	1312035
200.8	Chromium	< 10.0	U	ug/L	5.00	5	12/10/2013	SV	1312035
200.8	Cobalt	< 1.00	U	ug/L	0.500	5	12/10/2013	SV	1312035
200.8	Copper	< 5.00	U	ug/L	2.50	5	12/10/2013	SV	1312035
200.8	Lead	< 1.00	U	ug/L	0.500	5	12/10/2013	SV	1312035
200.8	**Molybdenum**	**0.967**	J	ug/L	0.500	5	12/10/2013	SV	1312035
200.8	Nickel	< 5.00	U	ug/L	2.50	5	12/10/2013	SV	1312035
200.8	Selenium	< 10.0	U	ug/L	2.50	5	12/10/2013	SV	1312035
200.8	Silver	< 5.00	U	ug/L	2.50	5	12/10/2013	SV	1312035
200.8	Thallium	< 5.00	U	ug/L	2.50	5	12/10/2013	SV	1312035
200.8	Thorium	< 5.00	U	ug/L	2.50	5	12/10/2013	SV	1312035
200.8	**Uranium**	**0.578**	J	ug/L	0.500	5	12/10/2013	SV	1312035
200.8	Vanadium	< 15.0	U	ug/L	10.0	5	12/10/2013	SV	1312035

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Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: MW-109S **Date / Time Sampled:** 11/13/13 13:41 **Workorder:** C131107
EPA Tag No.: 8-B **Matrix:** Ground Water **Lab Number:** C131107-23 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	**Aluminum**	**37100**		ug/L	200	10	12/10/2013	SV	1312035
200.7	Beryllium	< 50.0	U	ug/L	20.0	10	12/10/2013	SV	1312035
200.7	**Calcium**	**553000**		ug/L	500	10	12/10/2013	SV	1312035
200.7	**Iron**	**79400**		ug/L	1000	10	12/10/2013	SV	1312035
200.7	**Magnesium**	**119000**		ug/L	1000	10	12/10/2013	SV	1312035
200.7	**Manganese**	**2350**		ug/L	20.0	10	12/10/2013	SV	1312035
200.7	**Potassium**	**31200**		ug/L	2500	10	12/10/2013	SV	1312035
200.7	**Sodium**	**63700**		ug/L	2500	10	12/10/2013	SV	1312035
200.7	**Zinc**	**1370**		ug/L	100	10	12/10/2013	SV	1312035
200.8	Antimony	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Arsenic**	**176**		ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Barium**	**1010**		ug/L	50.0	10	12/10/2013	SV	1312035
200.8	**Cadmium**	**13.6**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Chromium**	**40.3**		ug/L	10.0	10	12/10/2013	SV	1312035
200.8	**Cobalt**	**21.6**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Copper**	**271**		ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Lead**	**462**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Molybdenum**	**20.9**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Nickel**	**32.4**		ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Selenium**	**5.88**	J	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Silver**	**6.17**	J	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Thallium	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Thorium**	**21.4**		ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Uranium**	**5.14**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Vanadium**	**87.0**		ug/L	20.0	10	12/10/2013	SV	1312035

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Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: MW-110 **Date / Time Sampled:** 11/13/13 13:00 **Workorder:** C131107
EPA Tag No.: 8-B **Matrix:** Ground Water **Lab Number:** C131107-26 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	**Aluminum**	**110000**		ug/L	200	10	12/10/2013	SV	1312035
200.7	Beryllium	< 50.0	U	ug/L	20.0	10	12/10/2013	SV	1312035
200.7	**Calcium**	**269000**		ug/L	500	10	12/10/2013	SV	1312035
200.7	**Iron**	**221000**		ug/L	1000	10	12/10/2013	SV	1312035
200.7	**Magnesium**	**115000**		ug/L	1000	10	12/10/2013	SV	1312035
200.7	**Manganese**	**10400**		ug/L	20.0	10	12/10/2013	SV	1312035
200.7	**Potassium**	**36300**		ug/L	2500	10	12/10/2013	SV	1312035
200.7	**Sodium**	**35300**		ug/L	2500	10	12/10/2013	SV	1312035
200.7	**Zinc**	**6340**		ug/L	100	10	12/10/2013	SV	1312035
200.8	Antimony	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Arsenic**	**387**		ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Barium**	**1160**		ug/L	50.0	10	12/10/2013	SV	1312035
200.8	**Cadmium**	**42.8**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Chromium**	**193**		ug/L	10.0	10	12/10/2013	SV	1312035
200.8	**Cobalt**	**63.2**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Copper**	**573**		ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Lead**	**2360**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Molybdenum**	**34.3**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Nickel**	**119**		ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Selenium	< 20.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Silver**	**14.5**		ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Thallium	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Thorium**	**22.7**		ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Uranium**	**6.80**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Vanadium**	**242**		ug/L	20.0	10	12/10/2013	SV	1312035

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Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: MW-2D **Date / Time Sampled:** 11/13/13 10:58 **Workorder:** C131107
EPA Tag No.: 8-B **Matrix:** Ground Water **Lab Number:** C131107-29 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	**Aluminum**	**2740**		ug/L	200	10	12/10/2013	SV	1312035
200.7	Beryllium	< 50.0	U	ug/L	20.0	10	12/10/2013	SV	1312035
200.7	**Calcium**	**252000**		ug/L	500	10	12/10/2013	SV	1312035
200.7	**Iron**	**4810**		ug/L	1000	10	12/10/2013	SV	1312035
200.7	**Magnesium**	**23700**		ug/L	1000	10	12/10/2013	SV	1312035
200.7	**Manganese**	**83.3**		ug/L	20.0	10	12/10/2013	SV	1312035
200.7	**Potassium**	**3590**	J	ug/L	2500	10	12/10/2013	SV	1312035
200.7	**Sodium**	**14400**		ug/L	2500	10	12/10/2013	SV	1312035
200.7	Zinc	< 200	U	ug/L	100	10	12/10/2013	SV	1312035
200.8	Antimony	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Arsenic**	**5.91**	J	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Barium	< 100	U	ug/L	50.0	10	12/10/2013	SV	1312035
200.8	**Cadmium**	**1.62**	J	ug/L	1.00	10	12/10/2013	SV	1312035
200.8	Chromium	< 20.0	U	ug/L	10.0	10	12/10/2013	SV	1312035
200.8	Cobalt	< 2.00	U	ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Copper**	**9.62**	J	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Lead**	**13.8**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Molybdenum**	**7.26**	J	ug/L	1.00	10	12/10/2013	SV	1312035
200.8	Nickel	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Selenium	< 20.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Silver	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Thallium	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Thorium	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Uranium**	**4.93**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	Vanadium	< 30.0	U	ug/L	20.0	10	12/10/2013	SV	1312035

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Metals (Total Recov) by EPA 200/7000 Series Methods

Station ID: MW-3D **Date / Time Sampled:** 11/13/13 11:46 **Workorder:** C131107
EPA Tag No.: 8-B **Matrix:** Ground Water **Lab Number:** C131107-31 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
200.7	**Aluminum**	**15500**		ug/L	200	10	12/10/2013	SV	1312035
200.7	Beryllium	< 50.0	U	ug/L	20.0	10	12/10/2013	SV	1312035
200.7	**Calcium**	**248000**		ug/L	500	10	12/10/2013	SV	1312035
200.7	**Iron**	**21000**		ug/L	1000	10	12/10/2013	SV	1312035
200.7	**Magnesium**	**27300**		ug/L	1000	10	12/10/2013	SV	1312035
200.7	**Manganese**	**1510**		ug/L	20.0	10	12/10/2013	SV	1312035
200.7	**Potassium**	**9490**	J	ug/L	2500	10	12/10/2013	SV	1312035
200.7	**Sodium**	**14100**		ug/L	2500	10	12/10/2013	SV	1312035
200.7	**Zinc**	**669**		ug/L	100	10	12/10/2013	SV	1312035
200.8	Antimony	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Arsenic**	**14.1**	J	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Barium**	**394**		ug/L	50.0	10	12/10/2013	SV	1312035
200.8	**Cadmium**	**18.6**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Chromium**	**11.0**	J	ug/L	10.0	10	12/10/2013	SV	1312035
200.8	**Cobalt**	**5.40**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Copper**	**156**		ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Lead**	**345**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Molybdenum**	**11.7**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	Nickel	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Selenium**	**7.96**	J	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Silver	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Thallium	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	Thorium	< 10.0	U	ug/L	5.00	10	12/10/2013	SV	1312035
200.8	**Uranium**	**2.88**		ug/L	1.00	10	12/10/2013	SV	1312035
200.8	**Vanadium**	**30.4**		ug/L	20.0	10	12/10/2013	SV	1312035

"J" Qualifier indicates an estimated value

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

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Classical Chemistry by EPA/ASTM/APHA Methods

Station ID: CHV-101U **Date / Time Sampled:** 11/13/13 09:46 **Workorder:** C131107
EPA Tag No.: 8-C **Matrix:** Ground Water **Lab Number:** C131107-03 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 300.0	Chloride	< 20.0	U	mg/L	10.0	10	11/19/2013	NP	1311056
EPA 300.0	**Fluoride**	**2.2**		mg/L	1.0	10	11/19/2013	NP	1311056
EPA 300.0	Nitrate/Nitrite as N	< 5.0	U	mg/L	2.0	10	11/19/2013	NP	1311056
EPA 300.0	**Sulfate as SO4**	**631**		mg/L	20.0	10	11/19/2013	NP	1311056

Classical Chemistry by EPA/ASTM/APHA Methods

Station ID: DR-1 **Date / Time Sampled:** 11/13/13 15:47 **Workorder:** C131107
EPA Tag No.: 8-C **Matrix:** Surface Water **Lab Number:** C131107-06 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 300.0	**Chloride**	**1.7**	J	mg/L	1.0	1	11/19/2013	NP	1311056
EPA 300.0	**Fluoride**	**0.1**	J	mg/L	0.1	1	11/19/2013	NP	1311056
EPA 300.0	Nitrate/Nitrite as N	< 0.5	U	mg/L	0.2	1	11/19/2013	NP	1311056
EPA 300.0	**Sulfate as SO4**	**29.8**		mg/L	2.0	1	11/19/2013	NP	1311056

Classical Chemistry by EPA/ASTM/APHA Methods

Station ID: DR-3 **Date / Time Sampled:** 11/13/13 10:16 **Workorder:** C131107
EPA Tag No.: 8-C **Matrix:** Surface Water **Lab Number:** C131107-11 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 300.0	Chloride	< 20.0	U	mg/L	10.0	10	11/19/2013	NP	1311056
EPA 300.0	**Fluoride**	**2.5**		mg/L	1.0	10	11/19/2013	NP	1311056
EPA 300.0	Nitrate/Nitrite as N	< 5.0	U	mg/L	2.0	10	11/19/2013	NP	1311056
EPA 300.0	**Sulfate as SO4**	**599**		mg/L	20.0	10	11/19/2013	NP	1311056

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Classical Chemistry by EPA/ASTM/APHA Methods

Station ID: DR-6 **Date / Time Sampled:** 11/13/13 14:08 **Workorder:** C131107
EPA Tag No.: 8-C **Matrix:** Surface Water **Lab Number:** C131107-18 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 300.0	Chloride	< 20.0	U	mg/L	10.0	10	11/19/2013	NP	1311056
EPA 300.0	**Fluoride**	**2.6**		mg/L	1.0	10	11/19/2013	NP	1311056
EPA 300.0	Nitrate/Nitrite as N	< 5.0	U	mg/L	2.0	10	11/19/2013	NP	1311056
EPA 300.0	**Sulfate as SO4**	**636**		mg/L	20.0	10	11/19/2013	NP	1311056

Classical Chemistry by EPA/ASTM/APHA Methods

Station ID: DR-7 **Date / Time Sampled:** 11/13/13 12:56 **Workorder:** C131107
EPA Tag No.: 8-C **Matrix:** Surface Water **Lab Number:** C131107-21 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 300.0	**Chloride**	**1.8**	J	mg/L	1.0	1	11/19/2013	NP	1311056
EPA 300.0	**Fluoride**	**0.4**		mg/L	0.1	1	11/19/2013	NP	1311056
EPA 300.0	Nitrate/Nitrite as N	< 0.5	U	mg/L	0.2	1	11/19/2013	NP	1311056
EPA 300.0	**Sulfate as SO4**	**95.8**		mg/L	2.0	1	11/19/2013	NP	1311056

Classical Chemistry by EPA/ASTM/APHA Methods

Station ID: MW-109S **Date / Time Sampled:** 11/13/13 13:41 **Workorder:** C131107
EPA Tag No.: 8-C **Matrix:** Ground Water **Lab Number:** C131107-24 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 300.0	**Chloride**	**10.1**	J	mg/L	10.0	10	11/19/2013	NP	1311056
EPA 300.0	**Fluoride**	**2.2**		mg/L	1.0	10	11/19/2013	NP	1311056
EPA 300.0	Nitrate/Nitrite as N	< 5.0	U	mg/L	2.0	10	11/19/2013	NP	1311056
EPA 300.0	**Sulfate as SO4**	**957**		mg/L	20.0	10	11/19/2013	NP	1311056

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Classical Chemistry by EPA/ASTM/APHA Methods

Station ID: MW-110 **Date / Time Sampled:** 11/13/13 13:00 **Workorder:** C131107
EPA Tag No.: 8-C **Matrix:** Ground Water **Lab Number:** C131107-27 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 300.0	**Chloride**	**10.0**	J	mg/L	10.0	10	11/19/2013	NP	1311056
EPA 300.0	**Fluoride**	**2.6**		mg/L	1.0	10	11/19/2013	NP	1311056
EPA 300.0	Nitrate/Nitrite as N	< 5.0	U	mg/L	2.0	10	11/19/2013	NP	1311056
EPA 300.0	**Sulfate as SO4**	**525**		mg/L	20.0	10	11/19/2013	NP	1311056

"J" Qualifier indicates an estimated value

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

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Metals (Dissolved) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
ICPMS-PE DRC-II									
Batch 1312040 - No Lab Prep Reqd			*Water*						**ICPMS-PE DRC-II**
Method Blank (1312040-BLK1)		Dilution Factor: 1				Prepared: 12/09/13 Analyzed: 12/10/13			
Vanadium	< 2.00	3.00	ug/L						
Chromium	< 1.00	2.00	"						
Cobalt	< 0.100	0.200	"						
Nickel	< 0.500	1.00	"						
Copper	1.02	1.00	"						
Arsenic	< 0.500	2.00	"						
Selenium	< 0.500	2.00	"						
Molybdenum	0.812	0.200	"						
Silver	< 0.500	1.00	"						
Cadmium	< 0.100	0.200	"						
Antimony	< 0.500	1.00	"						
Barium	< 5.00	10.0	"						
Thallium	< 0.500	1.00	"						
Lead	< 0.100	0.200	"						
Thorium	< 0.500	1.00	"						
Uranium	< 0.100	0.200	"						
Method Blank Spike (1312040-BS1)		Dilution Factor: 1				Prepared: 12/09/13 Analyzed: 12/10/13			
Vanadium	91.3	3.00	ug/L	100		91	85-115		
Chromium	89.9	2.00	"	100		90	85-115		
Cobalt	86.5	0.200	"	100		86	85-115		
Nickel	87.1	1.00	"	100		87	85-115		
Copper	87.8	1.00	"	100		88	85-115		
Arsenic	94.4	2.00	"	100		94	85-115		
Selenium	491	2.00	"	500		98	85-115		
Molybdenum	93.7	0.200	"	100		94	85-115		
Silver	96.8	1.00	"	100		97	85-115		
Cadmium	94.7	0.200	"	100		95	85-115		
Antimony	95.8	1.00	"	100		96	85-115		
Barium	97.1	10.0	"	100		97	85-115		
Thallium	97.2	1.00	"	100		97	85-115		
Lead	95.4	0.200	"	100		95	85-115		
Thorium	97.7	1.00	"	100		98	80-120		
Uranium	94.1	0.200	"	100		94	85-115		

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Metals (Dissolved) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1312040 - No Lab Prep Reqd			*Water*						ICPMS-PE DRC-II
Duplicate (1312040-DUP1)		Dilution Factor: 1		Source: C131107-04		Prepared: 12/09/13 Analyzed: 12/10/13			
Vanadium	< 2.00	3.00	ug/L		2.00				20
Chromium	5.61	2.00	"		5.40			4	20
Cobalt	< 0.100	0.200	"		< 0.100				20
Nickel	< 0.500	1.00	"		< 0.500				20
Copper	< 0.500	1.00	"		< 0.500				20
Arsenic	< 0.500	2.00	"		< 0.500				20
Selenium	< 0.500	2.00	"		< 0.500				20
Molybdenum	0.678	0.200	"		0.813			18	20
Silver	< 0.500	1.00	"		< 0.500				20
Cadmium	< 0.100	0.200	"		< 0.100				20
Antimony	< 0.500	1.00	"		< 0.500				20
Barium	55.9	10.0	"		56.3			0.7	20
Thallium	< 0.500	1.00	"		< 0.500				20
Lead	< 0.100	0.200	"		< 0.100				20
Thorium	< 0.500	1.00	"		< 0.500				20
Uranium	0.261	0.200	"		0.249			5	20
Matrix Spike (1312040-MS1)		Dilution Factor: 1		Source: C131107-04		Prepared: 12/09/13 Analyzed: 12/10/13			
Vanadium	92.8	3.00	ug/L	100	2.00	91	70-130		
Chromium	88.0	2.00	"	100	5.40	83	70-130		
Cobalt	85.3	0.200	"	100	< 0.100	85	70-130		
Nickel	84.8	1.00	"	100	< 0.500	85	70-130		
Copper	88.8	1.00	"	100	< 0.500	89	70-130		
Arsenic	93.8	2.00	"	100	< 0.500	94	70-130		
Selenium	538	2.00	"	500	< 0.500	108	70-130		
Molybdenum	92.8	0.200	"	100	0.813	92	70-130		
Silver	95.5	1.00	"	100	< 0.500	95	70-130		
Cadmium	96.2	0.200	"	100	< 0.100	96	70-130		
Antimony	95.4	1.00	"	100	< 0.500	95	70-130		
Barium	154	10.0	"	100	56.3	98	70-130		
Thallium	99.3	1.00	"	100	< 0.500	99	70-130		
Lead	94.8	0.200	"	100	< 0.100	95	70-130		
Thorium	95.9	1.00	"	100	< 0.500	96	70-130		
Uranium	93.7	0.200	"	100	0.249	93	70-130		

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Metals (Dissolved) by EPA 200/7000 Series Methods - Quality Control

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Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1312040 - No Lab Prep Reqd			*Water*						ICPMS-PE DRC-II
Matrix Spike (1312040-MS2)		Dilution Factor: 1		Source: C131107-07		Prepared: 12/09/13 Analyzed: 12/10/13			
Vanadium	94.4	3.00	ug/L	100	< 2.00	94	70-130		
Chromium	94.2	2.00	"	100	4.75	89	70-130		
Cobalt	85.8	0.200	"	100	0.113	86	70-130		
Nickel	85.7	1.00	"	100	< 0.500	86	70-130		
Copper	84.0	1.00	"	100	< 0.500	84	70-130		
Arsenic	98.2	2.00	"	100	< 0.500	98	70-130		
Selenium	530	2.00	"	500	0.543	106	70-130		
Molybdenum	94.3	0.200	"	100	1.36	93	70-130		
Silver	96.6	1.00	"	100	< 0.500	97	70-130		
Cadmium	96.5	0.200	"	100	< 0.100	96	70-130		
Antimony	96.0	1.00	"	100	< 0.500	96	70-130		
Barium	159	10.0	"	100	58.6	101	70-130		
Thallium	97.0	1.00	"	100	< 0.500	97	70-130		
Lead	95.9	0.200	"	100	< 0.100	96	70-130		
Thorium	96.6	1.00	"	100	< 0.500	97	70-130		
Uranium	95.1	0.200	"	100	0.331	95	70-130		
Batch 1312041 - 1312040			*Water*						ICPMS-PE DRC-II
Serial Dilution (1312041-SRD1)		Dilution Factor: 5		Source: C131107-04		Prepared: 12/09/13 Analyzed: 12/10/13			
Vanadium	< 10.0	15.0	ug/L		2.00				10
Chromium	5.84	10.0	"		5.40			8	10
Cobalt	< 0.500	1.00	"		< 0.10				10
Nickel	< 2.50	5.00	"		< 0.50				10
Copper	< 2.50	5.00	"		< 0.50				10
Arsenic	< 2.50	10.0	"		< 0.50				10
Selenium	< 2.50	10.0	"		< 0.50				10
Molybdenum	0.874	1.00	"		0.813			7	10
Silver	< 2.50	5.00	"		< 0.50				10
Cadmium	< 0.500	1.00	"		< 0.10				10
Antimony	< 2.50	5.00	"		< 0.50				10
Barium	58.0	50.0	"		56.3			3	10
Thallium	< 2.50	5.00	"		< 0.50				10
Lead	< 0.500	1.00	"		< 0.10				10
Thorium	< 2.50	5.00	"		< 0.50				10
Uranium	< 0.500	1.00	"		0.249				10

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Metals (Dissolved) by EPA 200/7000 Series Methods - Quality Control

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Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
ICPOE - PE Optima									
Batch 1312039 - No Lab Prep Reqd			*Water*						**ICPOE - PE Optima**
Method Blank (1312039-BLK1)		Dilution Factor: 1				Prepared: 12/09/13 Analyzed: 12/10/13			
Aluminum	< 20.0	50.0	ug/L						
Beryllium	< 2.00	5.00	"						
Calcium	< 50.0	100	"						
Iron	< 100	250	"						
Potassium	< 250	1000	"						
Magnesium	< 100	250	"						
Manganese	< 2.00	5.00	"						
Sodium	< 250	1000	"						
Zinc	< 10.0	20.0	"						
Method Blank Spike (1312039-BS1)		Dilution Factor: 1				Prepared: 12/09/13 Analyzed: 12/10/13			
Aluminum	10510	50.0	ug/L	10100		104	85-115		
Beryllium	100.3	5.00	"	100		100	85-115		
Calcium	10450	100	"	10100		103	85-115		
Iron	10270	250	"	10100		102	85-115		
Potassium	10510	1000	"	10100		104	85-115		
Magnesium	10650	250	"	10100		105	85-115		
Manganese	97.79	5.00	"	100		98	85-115		
Sodium	10430	1000	"	10100		103	85-115		
Zinc	99.09	20.0	"	100		99	85-115		
Duplicate (1312039-DUP1)		Dilution Factor: 1	Source: C131107-04			Prepared: 12/09/13 Analyzed: 12/10/13			
Aluminum	52.68	50.0	ug/L		45.37			15	20
Beryllium	< 2.00	5.00	"		< 2.00				20
Calcium	32870	100	"		33060			0.6	20
Iron	< 100	250	"		< 100				20
Potassium	578.9	1000	"		629.7			8	20
Magnesium	5452	250	"		5539			2	20
Manganese	11.62	5.00	"		11.60			0.2	20
Sodium	2452	1000	"		2503			2	20
Zinc	< 10.0	20.0	"		< 10.0				20

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Metals (Dissolved) by EPA 200/7000 Series Methods - Quality Control

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Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1312039 - No Lab Prep Reqd			*Water*						ICPOE - PE Optima
Matrix Spike (1312039-MS1)		Dilution Factor: 1		Source: C131107-04		Prepared: 12/09/13 Analyzed: 12/10/13			
Aluminum	10760	50.0	ug/L	10100	45.37	106	75-125		
Beryllium	99.71	5.00	"	100	< 2.00	100	75-125		
Calcium	43020	100	"	10100	33060	99	75-125		
Iron	10500	250	"	10100	< 100	104	75-125		
Potassium	11320	1000	"	10100	629.7	106	75-125		
Magnesium	16080	250	"	10100	5539	104	75-125		
Manganese	107.2	5.00	"	100	11.60	96	75-125		
Sodium	12990	1000	"	10100	2503	104	75-125		
Zinc	98.03	20.0	"	100	< 10.0	98	75-125		
Matrix Spike (1312039-MS2)		Dilution Factor: 1		Source: C131107-07		Prepared: 12/09/13 Analyzed: 12/10/13			
Aluminum	10500	50.0	ug/L	10100	36.77	104	75-125		
Beryllium	101.2	5.00	"	100	< 2.00	101	75-125		
Calcium	47190	100	"	10100	38070	90	75-125		
Iron	10210	250	"	10100	< 100	101	75-125		
Potassium	11160	1000	"	10100	665.8	104	75-125		
Magnesium	16230	250	"	10100	5891	102	75-125		
Manganese	154.3	5.00	"	100	57.42	97	75-125		
Sodium	13020	1000	"	10100	2692	102	75-125		
Zinc	102.7	20.0	"	100	< 10.0	103	75-125		
Batch 1312045 - 1312039			*Water*						ICPOE - PE Optima
Serial Dilution (1312045-SRD1)		Dilution Factor: 5		Source: C131107-04		Prepared: 12/09/13 Analyzed: 12/10/13			
Aluminum	< 100	250	ug/L		45.37				10
Beryllium	< 10.0	25.0	"		< 2.00				10
Calcium	33420	500	"		33060			1	10
Iron	< 500	1250	"		< 100.00				10
Potassium	< 1250	5000	"		629.7				10
Magnesium	5588	1250	"		5539			0.9	10
Manganese	11.62	25.0	"		11.60			0.1	10
Sodium	2507	5000	"		2503			0.1	10
Zinc	< 50.0	100	"		< 10.00				10

NOTE: %R = % Recovery, %R limits do not apply when sample levels exceed 4x the spike level.
RPD = Relative Percent Difference, %D = % Difference, DL = Detection Limit for QC sample

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Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

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Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
ICPMS-PE DRC-II									
Batch 1312035 - 200.2 - TR Metals			*Water*						**ICPMS-PE DRC-II**
Method Blank (1312035-BLK2)		Dilution Factor: 5				Prepared: 12/09/13 Analyzed: 12/10/13			
Vanadium	< 10.0	15.0	ug/L						
Chromium	< 5.00	10.0	"						
Cobalt	< 0.500	1.00	"						
Nickel	< 2.50	5.00	"						
Copper	< 2.50	5.00	"						
Arsenic	< 2.50	10.0	"						
Selenium	< 2.50	10.0	"						
Molybdenum	< 0.500	1.00	"						
Silver	< 2.50	5.00	"						
Cadmium	< 0.500	1.00	"						
Antimony	< 2.50	5.00	"						
Barium	< 25.0	50.0	"						
Thallium	< 2.50	5.00	"						
Lead	< 0.500	1.00	"						
Thorium	< 2.50	5.00	"						
Uranium	< 0.500	1.00	"						
Duplicate (1312035-DUP2)		Dilution Factor: 1	Source: C131107-02			Prepared: 12/09/13 Analyzed: 12/10/13			
Vanadium	27.86	30.0	ug/L		26.13			6	20
Chromium	24.53	20.0	"		28.05			13	20
Cobalt	14.24	2.00	"		14.60			2	20
Nickel	16.27	10.0	"		17.80			9	20
Copper	44.69	10.0	"		47.83			7	20
Arsenic	13.07	20.0	"		11.15			16	20
Selenium	< 5.00	20.0	"		< 5.00				20
Molybdenum	9.393	2.00	"		9.323			0.8	20
Silver	< 5.00	10.0	"		< 5.00				20
Cadmium	2.516	2.00	"		2.352			7	20
Antimony	< 5.00	10.0	"		< 5.00				20
Barium	329.2	100	"		325.2			1	20
Thallium	< 5.00	10.0	"		< 5.00				20
Lead	189.1	2.00	"		185.5			2	20
Thorium	11.72	10.0	"		10.98			6	20
Uranium	5.462	2.00	"		5.604			3	20

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Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1312035 - 200.2 - TR Metals			*Water*						ICPMS-PE DRC-II
Matrix Spike (1312035-MS2)		Dilution Factor: 1		Source: C131107-02		Prepared: 12/09/13 Analyzed: 12/10/13			
Vanadium	285.9	30.0	ug/L	300	26.13	87	70-130		
Chromium	364.9	20.0	"	400	28.05	84	70-130		
Cobalt	181.1	2.00	"	200	14.60	83	70-130		
Nickel	426.9	10.0	"	500	17.80	82	70-130		
Copper	289.6	10.0	"	300	47.83	81	70-130		
Arsenic	771.6	20.0	"	800	11.15	95	70-130		
Selenium	1950	20.0	"	2000	< 5.00	98	70-130		
Molybdenum	389.0	2.00	"	400	9.323	95	70-130		
Silver	73.76	10.0	"	75.0	< 5.00	98	70-130		
Cadmium	195.5	2.00	"	200	2.352	97	70-130		
Antimony	592.9	10.0	"	800	< 5.00	74	70-130		
Barium	545.3	100	"	200	325.2	110	70-130		
Thallium	2127	10.0	"	2000	< 5.00	106	70-130		
Lead	1234	2.00	"	1000	185.5	105	70-130		
Thorium	118.9	10.0	"	100	10.98	108	70-130		
Uranium	111.8	2.00	"	100	5.604	106	70-130		
Matrix Spike (1312035-MS4)		Dilution Factor: 5		Source: C131107-05		Prepared: 12/09/13 Analyzed: 12/10/13			
Vanadium	265.9	15.0	ug/L	300	< 10.0	89	70-130		
Chromium	349.8	10.0	"	400	< 5.00	87	70-130		
Cobalt	168.7	1.00	"	200	< 0.500	84	70-130		
Nickel	429.1	5.00	"	500	< 2.50	86	70-130		
Copper	264.7	5.00	"	300	< 2.50	88	70-130		
Arsenic	742.3	10.0	"	800	< 2.50	93	70-130		
Selenium	1869	10.0	"	2000	< 2.50	93	70-130		
Molybdenum	382.3	1.00	"	400	1.589	95	70-130		
Silver	72.30	5.00	"	75.0	< 2.50	96	70-130		
Cadmium	189.3	1.00	"	200	< 0.500	95	70-130		
Antimony	780.1	5.00	"	800	< 2.50	98	70-130		
Barium	276.5	50.0	"	200	64.42	106	70-130		
Thallium	2122	5.00	"	2000	2.824	106	70-130		
Lead	1044	1.00	"	1000	< 0.500	104	70-130		
Thorium	109.2	5.00	"	100	< 2.50	109	70-130		
Uranium	106.6	1.00	"	100	< 0.500	107	70-130		

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Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1312035 - 200.2 - TR Metals			*Water*						ICPMS-PE DRC-II
Reference (1312035-SRM2)		Dilution Factor: 2				Prepared: 12/09/13 Analyzed: 12/10/13			
Vanadium	957.9	60.0	ug/L	1000		96	85-115		
Chromium	953.4	40.0	"	1000		95	85-115		
Cobalt	925.3	4.00	"	1000		93	85-115		
Nickel	934.2	20.0	"	1000		93	85-115		
Copper	940.2	20.0	"	1000		94	85-115		
Arsenic	2066	40.0	"	2000		103	85-115		
Selenium	1017	40.0	"	1000		102	85-115		
Molybdenum	966.8	4.00	"	1000		97	85-115		
Silver	247.4	20.0	"	250		99	85-115		
Cadmium	976.3	4.00	"	1000		98	85-115		
Antimony	2025	20.0	"	2000		101	85-115		
Barium	1064	200	"	1000		106	85-115		
Thallium	5404	20.0	"	5000		108	85-115		
Lead	2128	4.00	"	2000		106	85-115		
Thorium	106.3	20.0	"	100		106	85-115		
Uranium	105.6	4.00	"	100		106	85-115		
Batch 1312042 - 1312035			*Water*						ICPMS-PE DRC-II
Serial Dilution (1312042-SRD1)		Dilution Factor: 5	Source: C131107-02			Prepared: 12/09/13 Analyzed: 12/10/13			
Vanadium	< 100	150	ug/L		26.13				10
Chromium	< 50.0	100	"		28.05				10
Cobalt	14.57	10.0	"		14.60			0.2	10
Nickel	< 25.0	50.0	"		17.80				10
Copper	44.27	50.0	"		47.83			8	10
Arsenic	< 25.0	100	"		11.15				10
Selenium	< 25.0	100	"		< 5.00				10
Molybdenum	5.788	10.0	"		9.323			47	200
Silver	< 25.0	50.0	"		< 5.00				10
Cadmium	< 5.00	10.0	"		2.352				10
Antimony	< 25.0	50.0	"		< 5.00				10
Barium	316.5	500	"		325.2			3	10
Thallium	< 25.0	50.0	"		< 5.00				10
Lead	183.9	10.0	"		185.5			0.9	10
Thorium	< 25.0	50.0	"		10.98				10
Uranium	5.432	10.0	"		5.604			3	10

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Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
ICPOE - PE Optima									
Batch 1312035 - 200.2 - TR Metals			*Water*						ICPOE - PE Optima
Method Blank (1312035-BLK1)		Dilution Factor: 1				Prepared: 12/09/13 Analyzed: 12/10/13			
Aluminum	< 20.0	50.0	ug/L						
Beryllium	< 2.00	5.00	"						
Calcium	< 50.0	100	"						
Iron	< 100	250	"						
Potassium	< 250	1000	"						
Magnesium	< 100	250	"						
Manganese	< 2.00	5.00	"						
Sodium	< 250	1000	"						
Zinc	< 10.0	20.0	"						
Duplicate (1312035-DUP1)		Dilution Factor: 1	Source: C131107-02			Prepared: 12/09/13 Analyzed: 12/10/13			
Aluminum	21940	500	ug/L		22090			0.7	20
Beryllium	< 20.0	50.0	"		< 20.0				20
Calcium	271300	1000	"		274500			1	20
Iron	32300	2500	"		32680			1	20
Potassium	10170	10000	"		10780			6	20
Magnesium	35260	2500	"		35480			0.6	20
Manganese	3317	50.0	"		3350			1	20
Sodium	14790	10000	"		14840			0.4	20
Zinc	334.9	200	"		351.5			5	20
Matrix Spike (1312035-MS1)		Dilution Factor: 1	Source: C131107-02			Prepared: 12/09/13 Analyzed: 12/10/13			
Aluminum	28470	500	ug/L	2000	22090	319	70-130		
Beryllium	196.4	50.0	"	200	< 20.0	98	70-130		
Calcium	270200	1000	"	1000	274500	NR	70-130		
Iron	35990	2500	"	3000	32680	110	70-130		
Potassium	20770	10000	"	10000	10780	100	70-130		
Magnesium	37500	2500	"	2000	35480	101	70-130		
Manganese	3485	50.0	"	200	3350	67	70-130		
Sodium	17690	10000	"	3000	14840	95	70-130		
Zinc	543.1	200	"	200	351.5	96	70-130		

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Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
Batch 1312035 - 200.2 - TR Metals			*Water*						ICPOE - PE Optima
Matrix Spike (1312035-MS3)		Dilution Factor: 1		Source: C131107-05		Prepared: 12/09/13 Analyzed: 12/10/13			
Aluminum	2079	50.0	ug/L	2000	227.2	93	70-130		
Beryllium	198.0	5.00	"	200	< 2.00	99	70-130		
Calcium	33310	100	"	1000	33160	15	70-130		
Iron	3005	250	"	3000	191.8	94	70-130		
Potassium	10150	1000	"	10000	640.2	95	70-130		
Magnesium	7295	250	"	2000	5481	91	70-130		
Manganese	212.8	5.00	"	200	15.34	99	70-130		
Sodium	5195	1000	"	3000	2410	93	70-130		
Zinc	196.1	20.0	"	200	< 10.0	98	70-130		
Reference (1312035-SRM1)		Dilution Factor: 1				Prepared: 12/09/13 Analyzed: 12/10/13			
Aluminum	945.0	50.0	ug/L	1000		95	85-115		
Beryllium	994.9	5.00	"	1000		99	85-115		
Calcium	909.5	100	"	1000		91	85-115		
Iron	847.8	250	"	1000		85	85-115		
Potassium	4716	1000	"	5000		94	85-115		
Magnesium	985.4	250	"	1000		99	85-115		
Manganese	1005	5.00	"	1000		101	85-115		
Sodium	925.0	1000	"	1000		92	85-115		
Zinc	1030	20.0	"	1000		103	85-115		
Batch 1312046 - 1312035			*Water*						ICPOE - PE Optima
Serial Dilution (1312046-SRD1)		Dilution Factor: 5		Source: C131107-02		Prepared: 12/09/13 Analyzed: 12/10/13			
Aluminum	21860	2500	ug/L		22090			1	10
Beryllium	< 100	250	"		< 20.00				10
Calcium	266900	5000	"		274500			3	10
Iron	31680	12500	"		32680			3	10
Potassium	< 12500	50000	"		10780				10
Magnesium	34770	12500	"		35480			2	10
Manganese	3353	250	"		3350			0.07	10
Sodium	14670	50000	"		14840			1	10
Zinc	< 500	1000	"		351.5				10

NOTE: %R = % Recovery, %R limits do not apply when sample levels exceed 4x the spike level.
RPD = Relative Percent Difference. %D = % Difference. DL = Detection Limit for QC sample.

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Classical Chemistry by EPA/ASTM/APHA Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
ESAT Dionex IC									
Batch 1311056 - No Prep Req			*Water*						**ESAT Dionex IC**
Method Blank (1311056-BLK1)		Dilution Factor: 1				Prepared & Analyzed: 11/19/13			
Fluoride	< 0.1	0.2	mg/L						
Chloride	< 1.0	2.0	"						
Sulfate as SO4	< 2.0	5.0	"						
Nitrate/Nitrite as N	< 0.2	0.5	"						
Method Blank Spike (1311056-BS1)		Dilution Factor: 1				Prepared & Analyzed: 11/19/13			
Fluoride	5.2	0.2	mg/L	5.00		105	90-110		
Chloride	24.4	2.0	"	25.0		98	90-110		
Sulfate as SO4	24.0	5.0	"	25.0		96	90-110		
Nitrate/Nitrite as N	20.7	0.5	"	20.0		103	90-110		
Duplicate (1311056-DUP1)		Dilution Factor: 1	**Source: C131107-03**			Prepared & Analyzed: 11/19/13			
Fluoride	2.2	2.0	mg/L		2.2			2	20
Chloride	< 10.0	20.0	"		< 10.0				20
Sulfate as SO4	633	50.0	"		631			0.3	20
Nitrate/Nitrite as N	< 2.0	5.0	"		< 2.0				20
Matrix Spike (1311056-MS1)		Dilution Factor: 1	**Source: C131107-03**			Prepared & Analyzed: 11/19/13			
Fluoride	52.1	2.0	mg/L	50.0	2.2	100	80-120		
Chloride	236	20.0	"	250	< 10.0	95	80-120		
Sulfate as SO4	818	50.0	"	250	631	75	80-120		
Nitrate/Nitrite as N	202	5.0	"	200	< 2.0	101	80-120		
Batch 1311068 - 1311056			*Water*						**ESAT Dionex IC**
Instrument Blank (1311068-IBL1)		Dilution Factor: 1				Prepared & Analyzed: 11/19/13			
Fluoride	< 0.1	0.2	mg/L						
Chloride	< 1.0	2.0	"						
Sulfate as SO4	< 2.0	5.0	"						
Nitrate/Nitrite as N	< 0.2	0.5	"						

NOTE: %R = % Recovery, %R limits do not apply when sample levels exceed 4x the spike level.
RPD = Relative Percent Difference, %D = % Difference, DL = Detection Limit for QC sample

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TechLaw Inc., ESAT Region 8
INORGANIC ANALYSES DATA SHEET
Intial and Continuing Calibration Blanks

Analytical Method: EPA 300.0 Analysis Name: WC - Anions by Ion Chromatography

Instrument: ESAT Dionex IC Work Order: Nu C131107

Analytical Sequence: 1311068 **Dissolved** Concentration Units: mg/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Fluoride	0.00	1	2	3	4	1311056-BLK1	NA	0.20
		0.00	0.00			0.00	NA	
		5	6	7	8			
Chloride	0.00	1	2	3	4	1311056-BLK1	NA	2.00
		0.00	0.00			0.00	NA	
		5	6	7	8			
Sulfate as SO4	0.00	1	2	3	4	1311056-BLK1	NA	5.00
		0.00	0.00			0.00	NA	
		5	6	7	8			
Nitrate/Nitrite as N	0.00	1	2	3	4	1311056-BLK1	NA	0.50
		0.00	0.00			0.00	NA	
		5	6	7	8			

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INORGANIC ANALYSES DATA SHEET

Intial and Continuing Calibration Blanks

Analytical Method: 200.8 Analysis Name: ICPMS Diss. Metals

Instrument: ICPMS-PE DRC-II Work Order: Nu C131107

Analytical Sequence: 1312041 Dissolved Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Vanadium	0.26	1	2	3	4	1312040-BLK1	NA	3.00
		0.19	0.50			0.29	NA	
		5	6	7	8			
Chromium	0.00	1	2	3	4	1312040-BLK1	NA	2.00
		0.07	0.00			-0.05	NA	
		5	6	7	8			
Cobalt	0.01	1	2	3	4	1312040-BLK1	NA	0.20
		0.01	0.01			0.00	NA	
		5	6	7	8			
Nickel	0.01	1	2	3	4	1312040-BLK1	NA	1.00
		0.01	0.00			-0.01	NA	
		5	6	7	8			
Copper	0.00	1	2	3	4	1312040-BLK1	NA	1.00
		0.01	0.03			1.02	NA	
		5	6	7	8			
Arsenic	0.33	1	2	3	4	1312040-BLK1	NA	2.00
		0.15	0.23			0.25	NA	
		5	6	7	8			
Selenium	0.11	1	2	3	4	1312040-BLK1	NA	2.00
		-0.06	-0.15			-0.21	NA	
		5	6	7	8			
Molybdenum	0.22	1	2	3	4	1312040-BLK1	NA	0.20
		0.20	0.09			0.81	NA	
		5	6	7	8			

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INORGANIC ANALYSES DATA SHEET

Intial and Continuing Calibration Blanks

Analytical Method: 200.8 Analysis Name: ICPMS Diss. Metals

Instrument: ICPMS-PE DRC-II Work Order: Nu C131107

Analytical Sequence: 1312041 Dissolved Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Silver	0.01	1	2	3	4	1312040-BLK1	NA	1.00
		0.01	0.01			0.00	NA	
		5	6	7	8			
Cadmium	0.01	1	2	3	4	1312040-BLK1	NA	0.20
		0.01	0.01			-0.01	NA	
		5	6	7	8			
Antimony	0.14	1	2	3	4	1312040-BLK1	NA	1.00
		0.14	0.10			0.00	NA	
		5	6	7	8			
Barium	0.00	1	2	3	4	1312040-BLK1	NA	10.00
		-0.01	0.02			-0.03	NA	
		5	6	7	8			
Thallium	0.01	1	2	3	4	1312040-BLK1	NA	1.00
		0.00	0.01			-0.05	NA	
		5	6	7	8			
Lead	0.01	1	2	3	4	1312040-BLK1	NA	0.20
		0.00	0.01			-0.01	NA	
		5	6	7	8			
Thorium	0.01	1	2	3	4	1312040-BLK1	NA	1.00
		0.01	0.01			-0.01	NA	
		5	6	7	8			
Uranium	0.01	1	2	3	4	1312040-BLK1	NA	0.20
		0.00	0.01			0.00	NA	
		5	6	7	8			

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INORGANIC ANALYSES DATA SHEET

Intial and Continuing Calibration Blanks

Analytical Method: 200.8 Analysis Name: ICPMS Tot. Rec. Metals

Instrument: **ICPMS-PE DRC-II** Work Order: Nu C131107

Analytical Sequence: 1312042 **Total Recoverable** Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Vanadium	0.26	1	2	3	4	NA	1312035-BLK2	3.00
		0.19	0.50	0.45	0.40	NA	-1.17	
		5	6	7	8			
Chromium	0.00	1	2	3	4	NA	1312035-BLK2	2.00
		0.07	0.00	0.05	0.04	NA	0.55	
		5	6	7	8			
Cobalt	0.01	1	2	3	4	NA	1312035-BLK2	0.20
		0.01	0.01	0.00	0.01	NA	0.00	
		5	6	7	8			
Nickel	0.01	1	2	3	4	NA	1312035-BLK2	1.00
		0.01	0.00	-0.03	-0.02	NA	-0.06	
		5	6	7	8			
Copper	0.00	1	2	3	4	NA	1312035-BLK2	1.00
		0.01	0.03	-0.04	-0.05	NA	-0.13	
		5	6	7	8			
Arsenic	0.33	1	2	3	4	NA	1312035-BLK2	2.00
		0.15	0.23	0.02	0.03	NA	-0.18	
		5	6	7	8			
Selenium	0.11	1	2	3	4	NA	1312035-BLK2	2.00
		-0.06	-0.15	0.01	-0.16	NA	0.00	
		5	6	7	8			
Molybdenum	0.22	1	2	3	4	NA	1312035-BLK2	0.20
		0.20	0.09	0.11	0.10	NA	-0.07	
		5	6	7	8			

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INORGANIC ANALYSES DATA SHEET

Intial and Continuing Calibration Blanks

Analytical Method: 200.8 Analysis Name: ICPMS Tot. Rec. Metals

Instrument: ICPMS-PE DRC-II Work Order: Nu C131107

Analytical Sequence: 1312042 **Total Recoverable** Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Silver	0.01	1	2	3	4	NA	1312035-BLK2	1.00
		0.01	0.01	0.01	0.01	NA	-0.01	
		5	6	7	8			
Cadmium	0.01	1	2	3	4	NA	1312035-BLK2	0.20
		0.01	0.01	0.00	0.01	NA	-0.01	
		5	6	7	8			
Antimony	0.14	1	2	3	4	NA	1312035-BLK2	1.00
		0.14	0.10	0.10	0.11	NA	0.00	
		5	6	7	8			
Barium	0.00	1	2	3	4	NA	1312035-BLK2	10.00
		-0.01	0.02	0.00	-0.01	NA	-0.02	
		5	6	7	8			
Thallium	0.01	1	2	3	4	NA	1312035-BLK2	1.00
		0.00	0.01	0.14	0.04	NA	-0.06	
		5	6	7	8			
Lead	0.01	1	2	3	4	NA	1312035-BLK2	0.20
		0.00	0.01	0.00	0.01	NA	-0.02	
		5	6	7	8			
Thorium	0.01	1	2	3	4	NA	1312035-BLK2	1.00
		0.01	0.01	0.01	0.01	NA	-0.01	
		5	6	7	8			
Uranium	0.01	1	2	3	4	NA	1312035-BLK2	0.20
		0.00	0.01	0.01	0.00	NA	0.00	
		5	6	7	8			

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Intial and Continuing Calibration Blanks

Analytical Method: 200.7 Analysis Name: ICPOE Diss. Metals

Instrument: ICPOE - PE Optima Work Order: Nu C131107

Analytical Sequence: 1312045 Dissolved Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Aluminum	13.35	1	2	3	4	1312039-BLK1	NA	50.00
		17.24	2.65			12.79	NA	
		5	6	7	8			
Beryllium	-0.16	1	2	3	4	1312039-BLK1	NA	5.00
		-0.47	0.07			-0.19	NA	
		5	6	7	8			
Calcium	-0.13	1	2	3	4	1312039-BLK1	NA	100.00
		-0.05	2.16			5.95	NA	
		5	6	7	8			
Iron	42.36	1	2	3	4	1312039-BLK1	NA	250.00
		35.25	6.27			67.56	NA	
		5	6	7	8			
Potassium	76.10	1	2	3	4	1312039-BLK1	NA	1,000.00
		100.33	84.42			70.38	NA	
		5	6	7	8			
Magnesium	0.04	1	2	3	4	1312039-BLK1	NA	250.00
		0.45	0.62			4.47	NA	
		5	6	7	8			
Manganese	0.10	1	2	3	4	1312039-BLK1	NA	5.00
		0.06	0.04			-0.02	NA	
		5	6	7	8			
Sodium	-4.18	1	2	3	4	1312039-BLK1	NA	1,000.00
		14.19	7.32			25.42	NA	
		5	6	7	8			

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 Certificate of Analysis

TDF #: A-025

TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Intial and Continuing Calibration Blanks

Analytical Method: 200.7 Analysis Name: ICPOE Diss. Metals

Instrument: ICPOE - PE Optima Work Order: Nu C131107

Analytical Sequence: 1312045 Dissolved Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
		1	2	3	4	1312039-BLK1	NA	
Zinc	-0.02	-0.36	0.54			-0.06	NA	20.00
		5	6	7	8			

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

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TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Intial and Continuing Calibration Blanks

Analytical Method: 200.7 Analysis Name: ICPOE Tot. Rec. Metals

Instrument: ICPOE - PE Optima Work Order: Nu C131107

Analytical Sequence: 1312046 **Total Recoverable** Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
Aluminum	13.35	1	2	3	4	1312035-BLK1	NA	50.00
		17.24	2.65	20.69	21.24	11.44	NA	
		5	6	7	8			
Beryllium	-0.16	1	2	3	4	1312035-BLK1	NA	5.00
		-0.47	0.07	-0.20	0.12	0.03	NA	
		5	6	7	8			
Calcium	-0.13	1	2	3	4	1312035-BLK1	NA	100.00
		-0.05	2.16	0.19	2.21	3.24	NA	
		5	6	7	8			
Iron	42.36	1	2	3	4	1312035-BLK1	NA	250.00
		35.25	6.27	24.74	34.89	28.17	NA	
		5	6	7	8			
Potassium	76.10	1	2	3	4	1312035-BLK1	NA	1,000.00
		100.33	84.42	172.16	162.88	29.24	NA	
		5	6	7	8			
Magnesium	0.04	1	2	3	4	1312035-BLK1	NA	250.00
		0.45	0.62	0.48	0.88	-2.38	NA	
		5	6	7	8			
Manganese	0.10	1	2	3	4	1312035-BLK1	NA	5.00
		0.06	0.04	0.11	0.13	0.18	NA	
		5	6	7	8			
Sodium	-4.18	1	2	3	4	1312035-BLK1	NA	1,000.00
		14.19	7.32	-4.12	-2.44	12.85	NA	
		5	6	7	8			

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw Inc., ESAT Region 8

INORGANIC ANALYSES DATA SHEET

Intial and Continuing Calibration Blanks

Analytical Method: 200.7 Analysis Name: ICPOE Tot. Rec. Metals

Instrument: ICPOE - PE Optima Work Order: Nu C131107

Analytical Sequence: 1312046 **Total Recoverable** Concentration Units: ug/L

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
		1	2	3	4	1312035-BLK1	NA	
Zinc	-0.02	-0.36	0.54	0.19	0.60	0.91	NA	20.00
		5	6	7	8			

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ESAT Dionex IC Method: EPA 300.0 Analysis Name: WC - Anions by Ion Chromatography 2013

Sequence: 1311068 Work Order: C131107 Units: mg/L

Dissolved Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Chloride	40.0	40.3	100.8		1			2			3	
				40.0	40.5	101.3	40.0	40.7	101.8			
					4			5			6	
					7			8			9	
Fluoride	4.00	4.0	100.0		1			2			3	
				4.00	4.0	100.0	4.00	4.0	100.0			
					4			5			6	
					7			8			9	
Nitrate/Nitrite as N	20.0	20.1	100.5		1			2			3	
				20.0	20.1	100.5	20.0	20.2	101.0			
					4			5			6	
					7			8			9	
Sulfate as SO4	100	101	101.0		1			2			3	
				100	101	101.0	100	102	102.0			
					4			5			6	
					7			8			9	

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 Certificate of Analysis

TDF #: A-025

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPMS-PE DRC-II Method: 200.8 Analysis Name: ICPMS Diss. Metals

Sequence: 1312041 Work Order: C131107 Units: ug/L

Dissolved Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Antimony	50.0	49.3	98.6		1			2			3	
				50.0	47.6	95.2	50.0	49.7	99.4			
					4			5			6	
					7			8			9	
Arsenic	50.0	50.8	101.6		1			2			3	
				50.0	48.3	96.6	50.0	50.2	100.4			
					4			5			6	
					7			8			9	
Barium	50.0	48.3	96.6		1			2			3	
				50.0	48.8	97.6	50.0	53.8	107.6			
					4			5			6	
					7			8			9	
Cadmium	50.0	49.7	99.4		1			2			3	
				50.0	47.8	95.6	50.0	50.7	101.4			
					4			5			6	
					7			8			9	
Chromium	50.0	49.1	98.2		1			2			3	
				50.0	47.7	95.4	50.0	47.5	95.0			
					4			5			6	
					7			8			9	
Cobalt	50.0	48.5	97.0		1			2			3	
				50.0	45.2	90.4	50.0	47.5	95.0			
					4			5			6	
					7			8			9	

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 Certificate of Analysis

TDF #: A-025

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPMS-PE DRC-II Method: 200.8 Analysis Name: ICPMS Diss. Metals

Sequence: 1312041 Work Order: C131107 Units: ug/L

Dissolved Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Copper	50.0	50.9	101.8		1			2			3	
				50.0	48.4	96.8	50.0	47.2	94.4			
					4			5			6	
					7			8			9	
Lead	50.0	48.5	97.0		1			2			3	
				50.0	49.3	98.6	50.0	53.7	107.4			
					4			5			6	
					7			8			9	
Molybdenum	50.0	49.6	99.2		1			2			3	
				50.0	48.4	96.8	50.0	50.6	101.2			
					4			5			6	
					7			8			9	
Nickel	50.0	50.5	101.0		1			2			3	
				50.0	48.2	96.4	50.0	47.9	95.8			
					4			5			6	
					7			8			9	
Selenium	50.0	50.3	100.6		1			2			3	
				50.0	49.1	98.2	50.0	51.1	102.2			
					4			5			6	
					7			8			9	
Silver	50.0	50.1	100.2		1			2			3	
				50.0	48.9	97.8	50.0	50.9	101.8			
					4			5			6	
					7			8			9	

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPMS-PE DRC-II Method: 200.8 Analysis Name: ICPMS Diss. Metals

Sequence: 1312041 Work Order: C131107 Units: ug/L

Dissolved Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Thallium	50.0	49.0	98.0		1			2			3	
				50.0	50.0	100.0	50.0	54.7	109.4			
					4			5			6	
					7			8			9	
Thorium	50.0	48.7	97.4		1			2			3	
				50.0	50.0	100.0	50.0	55.4	110.8			
					4			5			6	
					7			8			9	
Uranium	50.0	48.6	97.2		1			2			3	
				50.0	48.9	97.8	50.0	54.1	108.2			
					4			5			6	
					7			8			9	
Vanadium	50.0	51.3	102.6		1			2			3	
				50.0	47.8	95.6	50.0	47.6	95.2			
					4			5			6	
					7			8			9	

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 Certificate of Analysis

TDF #: A-025

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPMS-PE DRC-II Method: 200.8 Analysis Name: ICPMS Tot. Rec. Metals

Sequence: 1312042 Work Order: C131107 Units: ug/L

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Antimony	50.0	49.25	98.5		1			2			3	
				50.0	47.56	95.1	50.0	49.74	99.5	50.0	48.92	97.8
					4			5			6	
				50.0	48.41	96.8						
					7			8			9	
Arsenic	50.0	50.78	101.6		1			2			3	
				50.0	48.27	96.5	50.0	50.21	100.4	50.0	48.98	98.0
					4			5			6	
				50.0	47.97	95.9						
					7			8			9	
Barium	50.0	48.33	96.7		1			2			3	
				50.0	48.78	97.6	50.0	53.81	107.6	50.0	53.26	106.5
					4			5			6	
				50.0	52.66	105.3						
					7			8			9	
Cadmium	50.0	49.69	99.4		1			2			3	
				50.0	47.79	95.6	50.0	50.72	101.4	50.0	49.68	99.4
					4			5			6	
				50.0	48.89	97.8						
					7			8			9	
Chromium	50.0	49.06	98.1		1			2			3	
				50.0	47.67	95.3	50.0	47.49	95.0	50.0	49.20	98.4
					4			5			6	
				50.0	46.79	93.6						
					7			8			9	
Cobalt	50.0	48.47	96.9		1			2			3	
				50.0	45.18	90.4	50.0	47.48	95.0	50.0	46.57	93.1
					4			5			6	
				50.0	45.75	91.5						
					7			8			9	

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPMS-PE DRC-II Method: 200.8 Analysis Name: ICPMS Tot. Rec. Metals

Sequence: 1312042 Work Order: C131107 Units: ug/L

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Copper	50.0	50.94	101.9		1			2			3	
				50.0	48.42	96.8	50.0	47.22	94.4	50.0	48.55	97.1
					4			5			6	
				50.0	48.37	96.7						
					7			8			9	
Lead	50.0	48.46	96.9		1			2			3	
				50.0	49.35	98.7	50.0	53.75	107.5	50.0	54.15	108.3
					4			5			6	
				50.0	52.74	105.5						
					7			8			9	
Molybdenum	50.0	49.63	99.3		1			2			3	
				50.0	48.44	96.9	50.0	50.61	101.2	50.0	50.03	100.1
					4			5			6	
				50.0	48.68	97.4						
					7			8			9	
Nickel	50.0	50.49	101.0		1			2			3	
				50.0	48.17	96.3	50.0	47.94	95.9	50.0	47.55	95.1
					4			5			6	
				50.0	47.42	94.8						
					7			8			9	
Selenium	50.0	50.28	100.6		1			2			3	
				50.0	49.09	98.2	50.0	51.07	102.1	50.0	49.28	98.6
					4			5			6	
				50.0	47.03	94.1						
					7			8			9	
Silver	50.0	50.10	100.2		1			2			3	
				50.0	48.94	97.9	50.0	50.93	101.9	50.0	50.19	100.4
					4			5			6	
				50.0	49.01	98.0						
					7			8			9	

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

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TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPMS-PE DRC-II Method: 200.8 Analysis Name: ICPMS Tot. Rec. Metals

Sequence: 1312042 Work Order: C131107 Units: ug/L

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Thallium	50.0	48.97	97.9		1			2			3	
				50.0	50.04	100.1	50.0	54.74	109.5	50.0	54.92	109.8
					4			5			6	
				50.0	53.64	107.3						
					7			8			9	
Thorium	50.0	48.72	97.4		1			2			3	
				50.0	49.96	99.9	50.0	55.43	110.9	50.0	55.02	110.0
					4			5			6	
				50.0	54.06	108.1						
					7			8			9	
Uranium	50.0	48.64	97.3		1			2			3	
				50.0	48.88	97.8	50.0	54.07	108.1	50.0	53.67	107.3
					4			5			6	
				50.0	52.72	105.4						
					7			8			9	
Vanadium	50.0	51.32	102.6		1			2			3	
				50.0	47.78	95.6	50.0	47.56	95.1	50.0	49.55	99.1
					4			5			6	
				50.0	48.53	97.1						
					7			8			9	

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 Certificate of Analysis

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TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPOE - PE Optima Method: 200.7 Analysis Name: ICPOE Diss. Metals

Sequence: 1312045 Work Order: C131107 Units: ug/L

Dissolved Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Aluminum	12500	12750	102.0		1			2			3	
				12500	12700	101.6	12500	12420	99.4			
					4			5			6	
					7			8			9	
Beryllium	500	517.3	103.5		1			2			3	
				500	514.6	102.9	500	506.7	101.3			
					4			5			6	
					7			8			9	
Calcium	12500	12580	100.6		1			2			3	
				12500	12640	101.1	12500	12080	96.6			
					4			5			6	
					7			8			9	
Iron	12500	12510	100.1		1			2			3	
				12500	12510	100.1	12500	11850	94.8			
					4			5			6	
					7			8			9	
Magnesium	12500	12850	102.8		1			2			3	
				12500	12800	102.4	12500	12530	100.2			
					4			5			6	
					7			8			9	
Manganese	1000	1035	103.5		1			2			3	
				1000	1031	103.1	1000	1012	101.2			
					4			5			6	
					7			8			9	

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TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPOE - PE Optima Method: 200.7 Analysis Name: ICPOE Diss. Metals

Sequence: 1312045 Work Order: C131107 Units: ug/L

Dissolved Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Potassium	25000	25400	101.6		1			2			3	
				25000	24850	99.4	25000	24510	98.0			
					4			5			6	
					7			8			9	
Sodium	12500	12660	101.3		1			2			3	
				12500	12520	100.2	12500	12280	98.2			
					4			5			6	
					7			8			9	
Zinc	2500	2593	103.7		1			2			3	
				2500	2586	103.4	2500	2562	102.5			
					4			5			6	
					7			8			9	

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 Certificate of Analysis

TDF #: A-025

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPOE - PE Optima Method: 200.7 Analysis Name: ICPOE Tot. Rec. Metals

Sequence: 1312046 Work Order: C131107 Units: ug/L

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Aluminum	12500	12750	102.0		1			2			3	
				12500	12700	101.6	12500	12420	99.4	12500	12360	98.9
					4			5			6	
				12500	12490	99.9						
					7			8			9	
Beryllium	500	517.3	103.5		1			2			3	
				500	514.6	102.9	500	506.7	101.3	500	503.4	100.7
					4			5			6	
				500	508.1	101.6						
					7			8			9	
Calcium	12500	12580	100.6		1			2			3	
				12500	12640	101.1	12500	12080	96.6	12500	12180	97.4
					4			5			6	
				12500	12250	98.0						
					7			8			9	
Iron	12500	12510	100.1		1			2			3	
				12500	12510	100.1	12500	11850	94.8	12500	11840	94.7
					4			5			6	
				12500	11840	94.7						
					7			8			9	
Magnesium	12500	12850	102.8		1			2			3	
				12500	12800	102.4	12500	12530	100.2	12500	12420	99.4
					4			5			6	
				12500	12460	99.7						
					7			8			9	
Manganese	1000	1035	103.5		1			2			3	
				1000	1031	103.1	1000	1012	101.2	1000	1013	101.3
					4			5			6	
				1000	1013	101.3						
					7			8			9	

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

ICPOE - PE Optima Method: 200.7 Analysis Name: ICPOE Tot. Rec. Metals

Sequence: 1312046 Work Order: C131107 Units: ug/L

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Potassium	25000	25400	101.6		1			2			3	
				25000	24850	99.4	25000	24510	98.0	25000	24220	96.9
					4			5			6	
				25000	24460	97.8						
					7			8			9	
Sodium	12500	12660	101.3		1			2			3	
				12500	12520	100.2	12500	12280	98.2	12500	12100	96.8
					4			5			6	
				12500	12250	98.0						
					7			8			9	
Zinc	2500	2593	103.7		1			2			3	
				2500	2586	103.4	2500	2562	102.5	2500	2547	101.9
					4			5			6	
				2500	2565	102.6						
					7			8			9	

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw, Inc. - ESAT Region 8

ICP Interference Check Sample

ICPMS-PE DRC-II

Analyte	Check Sample	Result*	Units	True	%R	PQL
Sequence: 1312041	Analysis: ICPMS Diss. Metals					
Antimony	IFA1	0.1	ug/L			1.00
	IFB1	0.0	ug/L			1.00
Arsenic	IFA1	0.0	ug/L			2.00
	IFB1	20.3	ug/L	20	102	2.00
Barium	IFA1	0.1	ug/L			10.0
	IFB1	0.1	ug/L			10.0
Cadmium	IFA1	0.1	ug/L			0.200
	IFB1	19.8	ug/L	20	99	0.200
Chromium	IFA1	0.4	ug/L			2.00
	IFB1	19.6	ug/L	20	98	2.00
Cobalt	IFA1	0.0	ug/L			0.200
	IFB1	18.9	ug/L	20	95	0.200
Copper	IFA1	0.8	ug/L			1.00
	IFB1	19.2	ug/L	20	96	1.00
Lead	IFA1	0.1	ug/L			0.200
	IFB1	0.0	ug/L			0.200
Molybdenum	IFA1	202.0	ug/L	200	101	0.200
	IFB1	198.7	ug/L	200	99	0.200
Nickel	IFA1	0.0	ug/L			1.00
	IFB1	18.7	ug/L	20	94	1.00
Selenium	IFA1	0.0	ug/L			2.00
	IFB1	-0.2	ug/L			2.00
Silver	IFA1	0.0	ug/L			1.00
	IFB1	19.5	ug/L	20	97	1.00
Thallium	IFA1	0.0	ug/L			1.00
	IFB1	0.0	ug/L			1.00
Thorium	IFA1	0.0	ug/L			1.00
	IFB1	0.0	ug/L			1.00
Uranium	IFA1	0.0	ug/L			0.200
	IFB1	0.0	ug/L			0.200
Vanadium	IFA1	0.1	ug/L			3.00
	IFB1	-0.8	ug/L			3.00

*Criteria = 80-120%R of True Value or +/- PQL

See raw data for complete analyte list and results.

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw, Inc. - ESAT Region 8

ICP Interference Check Sample

ICPMS-PE DRC-II

Analyte	Check Sample	Result*	Units	True	%R	PQL
Sequence: 1312042	Analysis: ICPMS Tot. Rec. Metals					
Antimony	IFA1	0.1	ug/L			1.00
	IFB1	0.0	ug/L			1.00
Arsenic	IFA1	0.0	ug/L			2.00
	IFB1	20.3	ug/L	20	102	2.00
Barium	IFA1	0.1	ug/L			10.0
	IFB1	0.1	ug/L			10.0
Cadmium	IFA1	0.1	ug/L			0.200
	IFB1	19.8	ug/L	20	99	0.200
Chromium	IFA1	0.4	ug/L			2.00
	IFB1	19.6	ug/L	20	98	2.00
Cobalt	IFA1	0.0	ug/L			0.200
	IFB1	18.9	ug/L	20	95	0.200
Copper	IFA1	0.8	ug/L			1.00
	IFB1	19.2	ug/L	20	96	1.00
Lead	IFA1	0.1	ug/L			0.200
	IFB1	0.0	ug/L			0.200
Molybdenum	IFA1	202.0	ug/L	200	101	0.200
	IFB1	198.7	ug/L	200	99	0.200
Nickel	IFA1	0.0	ug/L			1.00
	IFB1	18.7	ug/L	20	94	1.00
Selenium	IFA1	0.0	ug/L			2.00
	IFB1	-0.2	ug/L			2.00
Silver	IFA1	0.0	ug/L			1.00
	IFB1	19.5	ug/L	20	97	1.00
Thallium	IFA1	0.0	ug/L			1.00
	IFB1	0.0	ug/L			1.00
Thorium	IFA1	0.0	ug/L			1.00
	IFB1	0.0	ug/L			1.00
Uranium	IFA1	0.0	ug/L			0.200
	IFB1	0.0	ug/L			0.200
Vanadium	IFA1	0.1	ug/L			3.00
	IFB1	-0.8	ug/L			3.00

*Criteria = 80-120%R of True Value or +/- PQL

See raw data for complete analyte list and results.

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw, Inc. - ESAT Region 8

ICP Interference Check Sample

ICPOE - PE Optima

Analyte	Check Sample	Result*	Units	True	%R	PQL
Sequence: 1312045 Analysis: ICPOE Diss. Metals						
Aluminum	IFA1	57,386.4	ug/L	60,000	96	50.0
	IFB1	57,064.5	ug/L	60,000	95	50.0
Beryllium	IFA1	-0.8	ug/L			5.00
	IFB1	95.9	ug/L	100	96	5.00
Calcium	IFA1	278,777.2	ug/L	300,000	93	100
	IFB1	277,067.9	ug/L	300,000	92	100
Iron	IFA1	225,487.6	ug/L	250,000	90	250
	IFB1	227,947.2	ug/L	250,000	91	250
Magnesium	IFA1	137,196.2	ug/L	150,000	91	250
	IFB1	136,568.0	ug/L	150,000	91	250
Manganese	IFA1	-1.3	ug/L			5.00
	IFB1	189.5	ug/L	200	95	5.00
Potassium	IFA1	54.0	ug/L			1000
	IFB1	19,854.9	ug/L	20,000	99	1000
Sodium	IFA1	49,077.4	ug/L	50,000	98	1000
	IFB1	48,644.1	ug/L	50,000	97	1000
Zinc	IFA1	-0.9	ug/L			20.0
	IFB1	279.3	ug/L	300	93	20.0

*Criteria = 80-120%R of True Value or +/- PQL

See raw data for complete analyte list and results.

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw, Inc. - ESAT Region 8

ICP Interference Check Sample

ICPOE - PE Optima

Analyte	Check Sample	Result*	Units	True	%R	PQL
Sequence: 1312046 Analysis: ICPOE Tot. Rec. Metals						
Aluminum	IFA1	57,386.4	ug/L	60,000	96	50.0
	IFB1	57,064.5	ug/L	60,000	95	50.0
Beryllium	IFA1	-0.8	ug/L			5.00
	IFB1	95.9	ug/L	100	96	5.00
Calcium	IFA1	278,777.2	ug/L	300,000	93	100
	IFB1	277,067.9	ug/L	300,000	92	100
Iron	IFA1	225,487.6	ug/L	250,000	90	250
	IFB1	227,947.2	ug/L	250,000	91	250
Magnesium	IFA1	137,196.2	ug/L	150,000	91	250
	IFB1	136,568.0	ug/L	150,000	91	250
Manganese	IFA1	-1.3	ug/L			5.00
	IFB1	189.5	ug/L	200	95	5.00
Potassium	IFA1	54.0	ug/L			1000
	IFB1	19,854.9	ug/L	20,000	99	1000
Sodium	IFA1	49,077.4	ug/L	50,000	98	1000
	IFB1	48,644.1	ug/L	50,000	97	1000
Zinc	IFA1	-0.9	ug/L			20.0
	IFB1	279.3	ug/L	300	93	20.0

*Criteria = 80-120%R of True Value or +/- PQL

See raw data for complete analyte list and results.

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 Certificate of Analysis

TDF #: A-025

TechLaw, Inc. - ESAT Region 8

Detection Limit (PQL) Standard

ICPMS-PE DRC-II

Metals (Dissolved) by EPA 200/7000 Series Methods

Sequence: 1312041

Analyte	True	Found	%R	Units
Antimony	1.00	1.01	101	ug/L
Arsenic	2.00	2.23	112	ug/L
Barium	0.500	0.504	101	ug/L
Cadmium	0.200	0.193	97	ug/L
Chromium	1.00	0.916	92	ug/L
Cobalt	0.200	0.205	103	ug/L
Copper	1.00	0.875	88	ug/L
Lead	0.200	0.201	101	ug/L
Molybdenum	0.200	0.207	104	ug/L
Nickel	1.00	0.968	97	ug/L
Selenium	1.00	1.44	144	ug/L
Silver	0.500	0.499	100	ug/L
Thallium	0.200	0.149	74	ug/L
Thorium	1.00	0.847	85	ug/L
Uranium	0.200	0.191	95	ug/L
Vanadium	2.00	2.12	106	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw, Inc. - ESAT Region 8

Detection Limit (PQL) Standard

ICPOE - PE Optima

Metals (Dissolved) by EPA 200/7000 Series Methods

Sequence: 1312045

Analyte	True	Found	%R	Units
Aluminum	100	113.4	113	ug/L
Beryllium	5.00	4.937	99	ug/L
Calcium	250	252.7	101	ug/L
Iron	100	107.7	108	ug/L
Magnesium	1000	1050	105	ug/L
Manganese	10.0	10.45	105	ug/L
Potassium	1000	1038	104	ug/L
Sodium	1000	1031	103	ug/L
Zinc	50.0	52.18	104	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 Certificate of Analysis

TDF #: A-025

TechLaw, Inc. - ESAT Region 8
Detection Limit (PQL) Standard
ICPMS-PE DRC-II

Metals (Total Recov) by EPA 200/7000 Series Methods

Sequence: 1312042

Analyte	True	Found	%R	Units
Antimony	1.00	1.012	101	ug/L
Arsenic	2.00	2.230	112	ug/L
Barium	0.500	0.5043	101	ug/L
Cadmium	0.200	0.1934	97	ug/L
Chromium	1.00	0.9157	92	ug/L
Cobalt	0.200	0.2052	103	ug/L
Copper	1.00	0.8755	88	ug/L
Lead	0.200	0.2013	101	ug/L
Molybdenum	0.200	0.2073	104	ug/L
Nickel	1.00	0.9676	97	ug/L
Selenium	1.00	1.443	144	ug/L
Silver	0.500	0.4995	100	ug/L
Thallium	0.200	0.1488	74	ug/L
Thorium	1.00	0.8470	85	ug/L
Uranium	0.200	0.1910	95	ug/L
Vanadium	2.00	2.125	106	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw, Inc. - ESAT Region 8
Detection Limit (PQL) Standard
ICPOE - PE Optima

Metals (Total Recov) by EPA 200/7000 Series Methods

Sequence: 1312046

Analyte	True	Found	%R	Units
Aluminum	100	113.4	113	ug/L
Beryllium	5.00	4.937	99	ug/L
Calcium	250	252.7	101	ug/L
Iron	100	107.7	108	ug/L
Magnesium	1000	1050	105	ug/L
Manganese	10.0	10.45	105	ug/L
Potassium	1000	1038	104	ug/L
Sodium	1000	1031	103	ug/L
Zinc	50.0	52.18	104	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: EPA 300.0 **Dissolved** **Sequence ID#:** 1311068

Instrument ID #: ESAT Dionex IC Water **LSR #:** A-025

Analysis ID	Sample Name	Analysis Date	Analysis Time
1311068-ICV1	Initial Cal Check	11/19/13	18:35
1311068-ICB1	Initial Cal Blank	11/19/13	18:53
1311068-SCV1	Secondary Cal Check	11/19/13	19:12
1311068-IBL1	Instrument Blank	11/19/13	19:30
1311056-BS1	Blank Spike	11/19/13	19:48
1311056-BLK1	Blank	11/19/13	20:06
C131107-03	CHV-101U	11/19/13	20:24
1311056-DUP1	Duplicate	11/19/13	20:42
1311056-MS1	Matrix Spike	11/19/13	21:00
C131107-06	DR-1	11/19/13	21:18
C131107-11	DR-3	11/19/13	21:36
C131107-18	DR-6	11/19/13	21:54
1311068-CCV1	Calibration Check	11/19/13	22:12
1311068-CCB1	Calibration Blank	11/19/13	22:30
C131107-21	DR-7	11/19/13	22:48
C131107-24	MW-109S	11/19/13	23:07
C131107-27	MW-110	11/19/13	23:25
1311068-CCV2	Calibration Check	11/19/13	23:43
1311068-CCB2	Calibration Blank	11/20/13	00:01

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: 200.8 **Dissolved** **Sequence ID#:** 1312041

Instrument ID #: ICPMS-PE DRC-II Water **LSR #:** A-025

Analysis ID	Sample Name	Analysis Date	Analysis Time
1312041-ICV1	Initial Cal Check	12/10/13	10:39
1312041-SCV1	Secondary Cal Check	12/10/13	10:43
1312041-ICB1	Initial Cal Blank	12/10/13	10:46
1312041-CRL1	Instrument RL Check	12/10/13	10:49
1312041-IFA1	Interference Check A	12/10/13	10:53
1312041-IFB1	Interference Check B	12/10/13	10:56
1312040-BLK1	Blank	12/10/13	10:59
C131107-04	DR-1	12/10/13	11:02
1312040-DUP1	Duplicate	12/10/13	11:05
1312041-SRD1	Serial Dilution	12/10/13	11:08
1312040-BS1	Blank Spike	12/10/13	11:11
1312040-MS1	Matrix Spike	12/10/13	11:14
C131107-07	DR-2	12/10/13	11:17
1312040-MS2	Matrix Spike	12/10/13	11:21
C131107-01	CHV-101U	12/10/13	11:24
1312041-CCV1	Calibration Check	12/10/13	11:30
1312041-CCB1	Calibration Blank	12/10/13	11:33
C131107-09	DR-3	12/10/13	11:36
C131107-12	DR-4	12/10/13	11:39
C131107-14	DR-5	12/10/13	11:42
C131107-16	DR-6	12/10/13	11:45
C131107-19	DR-7	12/10/13	11:48
C131107-22	MW-109S	12/10/13	11:52
C131107-25	MW-110	12/10/13	11:55
C131107-28	MW-2D	12/10/13	11:58
C131107-30	MW-3D	12/10/13	12:01
1312041-CCV2	Calibration Check	12/10/13	12:07
1312041-CCB2	Calibration Blank	12/10/13	12:10

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: 200.8 **Total Recoverable** **Sequence ID#:** 1312042

Instrument ID #: ICPMS-PE DRC-II Water **LSR #:** A-025

Analysis ID	Sample Name	Analysis Date	Analysis Time
1312042-ICV1	Initial Cal Check	12/10/13	10:39
1312042-SCV1	Secondary Cal Check	12/10/13	10:43
1312042-ICB1	Initial Cal Blank	12/10/13	10:46
1312042-CRL1	Instrument RL Check	12/10/13	10:49
1312042-IFA1	Interference Check A	12/10/13	10:53
1312042-IFB1	Interference Check B	12/10/13	10:56
1312042-CCV1	Calibration Check	12/10/13	11:30
1312042-CCB1	Calibration Blank	12/10/13	11:33
1312042-CCV2	Calibration Check	12/10/13	12:07
1312042-CCB2	Calibration Blank	12/10/13	12:10
1312035-BLK2	Blank	12/10/13	12:27
C131107-02	CHV-101U	12/10/13	12:30
1312035-DUP2	Duplicate	12/10/13	12:33
1312042-SRD1	Serial Dilution	12/10/13	12:36
1312035-SRM2	Reference	12/10/13	12:39
1312035-MS2	Matrix Spike	12/10/13	12:42
C131107-05	DR-1	12/10/13	12:45
1312035-MS4	Matrix Spike	12/10/13	12:48
C131107-08	DR-2	12/10/13	12:51
1312042-CCV3	Calibration Check	12/10/13	12:57
1312042-CCB3	Calibration Blank	12/10/13	13:01
C131107-10	DR-3	12/10/13	13:04
C131107-13	DR-4	12/10/13	13:07
C131107-15	DR-5	12/10/13	13:10
C131107-17	DR-6	12/10/13	13:13
C131107-20	DR-7	12/10/13	13:16
C131107-23	MW-109S	12/10/13	13:19
C131107-26	MW-110	12/10/13	13:22
C131107-29	MW-2D	12/10/13	13:25
C131107-31	MW-3D	12/10/13	13:28
1312042-CCV4	Calibration Check	12/10/13	13:42
1312042-CCB4	Calibration Blank	12/10/13	13:46

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: 200.7 **Dissolved** **Sequence ID#:** 1312045

Instrument ID #: ICPOE - PE Optima Water **LSR #:** A-025

Analysis ID	Sample Name	Analysis Date	Analysis Time
1312045-ICV1	Initial Cal Check	12/10/13	13:05
1312045-SCV1	Secondary Cal Check	12/10/13	13:08
1312045-ICB1	Initial Cal Blank	12/10/13	13:11
1312045-CRL1	Instrument RL Check	12/10/13	13:14
1312045-IFA1	Interference Check A	12/10/13	13:17
1312045-IFB1	Interference Check B	12/10/13	13:21
1312039-BLK1	Blank	12/10/13	13:25
1312039-BS1	Blank Spike	12/10/13	13:28
C131107-04	DR-1	12/10/13	13:31
1312039-DUP1	Duplicate	12/10/13	13:34
1312045-SRD1	Serial Dilution	12/10/13	13:37
1312039-MS1	Matrix Spike	12/10/13	13:40
C131107-07	DR-2	12/10/13	13:43
1312039-MS2	Matrix Spike	12/10/13	13:47
C131107-01	CHV-101U	12/10/13	13:50
1312045-CCV1	Calibration Check	12/10/13	13:56
1312045-CCB1	Calibration Blank	12/10/13	13:59
C131107-09	DR-3	12/10/13	14:02
C131107-12	DR-4	12/10/13	14:05
C131107-14	DR-5	12/10/13	14:08
C131107-16	DR-6	12/10/13	14:11
C131107-19	DR-7	12/10/13	14:14
C131107-22	MW-109S	12/10/13	14:18
C131107-25	MW-110	12/10/13	14:21
C131107-28	MW-2D	12/10/13	14:24
C131107-30	MW-3D	12/10/13	14:27
1312045-CCV2	Calibration Check	12/10/13	14:33
1312045-CCB2	Calibration Blank	12/10/13	14:36

Project Name: Rico-Argentine_Waters_NOV 2013_A-025 **Certificate of Analysis**

TDF #: A-025

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: 200.7 **Total Recoverable** **Sequence ID#:** 1312046

Instrument ID #: ICPOE - PE Optima Water **LSR #:** A-025

Analysis ID	Sample Name	Analysis Date	Analysis Time
1312046-ICV1	Initial Cal Check	12/10/13	13:05
1312046-SCV1	Secondary Cal Check	12/10/13	13:08
1312046-ICB1	Initial Cal Blank	12/10/13	13:11
1312046-CRL1	Instrument RL Check	12/10/13	13:14
1312046-IFA1	Interference Check A	12/10/13	13:17
1312046-IFB1	Interference Check B	12/10/13	13:21
1312046-CCV1	Calibration Check	12/10/13	13:56
1312046-CCB1	Calibration Blank	12/10/13	13:59
1312046-CCV2	Calibration Check	12/10/13	14:33
1312046-CCB2	Calibration Blank	12/10/13	14:36
1312035-BLK1	Blank	12/10/13	14:43
1312035-SRM1	Reference	12/10/13	14:46
C131107-02	CHV-101U	12/10/13	14:49
1312035-DUP1	Duplicate	12/10/13	14:53
1312046-SRD1	Serial Dilution	12/10/13	14:56
1312035-MS1	Matrix Spike	12/10/13	14:59
C131107-05	DR-1	12/10/13	15:02
1312035-MS3	Matrix Spike	12/10/13	15:05
C131107-08	DR-2	12/10/13	15:08
1312046-CCV3	Calibration Check	12/10/13	15:14
1312046-CCB3	Calibration Blank	12/10/13	15:17
C131107-10	DR-3	12/10/13	15:20
C131107-13	DR-4	12/10/13	15:23
C131107-15	DR-5	12/10/13	15:26
C131107-17	DR-6	12/10/13	15:29
C131107-20	DR-7	12/10/13	15:33
C131107-23	MW-109S	12/10/13	15:36
C131107-26	MW-110	12/10/13	15:39
C131107-29	MW-2D	12/10/13	15:42
C131107-31	MW-3D	12/10/13	15:45
1312046-CCV4	Calibration Check	12/10/13	15:51
1312046-CCB4	Calibration Blank	12/10/13	15:54

TechLaw
Quality & Integrity

ESAT Region 8

Perkin Elmer Optima 4300 ICP-OE

2013 MDLs and PQLs
Contract: EP-W-06-33

2012		Dissolved MDL u g/L	Tot Rec. MDL u g/L	Practical MDL u g/L	PQL H20 u g/L	PQL Soil mg/Kg	Linear Range mg/L
Ag	Silver	0.232	0.244	2.0	10	1.0	5.0
Al	Aluminum	5.32	15.10	20	50	5.0	100
As	Arsenic	24.8	20.8	60	100	10	20
B	Boron	3.48	4.41	50	250	25	100
Ba	Barium	0.255	0.224	2.0	5.0	0.5	20
Be	Beryllium	0.470	0.228	2.0	5.0	0.5	10
Ca	Calcium	3.34	3.14	100	250	25	1000
Cd	Cadmium	0.751	0.843	2.0	5.0	0.5	20
Co	Cobalt	0.765	0.760	2.0	5.0	0.5	20
Cr	Chromium	0.419	0.557	2.0	5.0	0.5	20
Cu	Copper	0.865	0.606	2.0	2.0	0.2	50
Fe	Iron	28.6	45.5	50	100	10	500
K	Potassium	26.3	52.9	250	1000	100	500
Mg	Magnesium	12	3.2	100	250	25	500
Mn	Manganese	0.051	0.075	2.0	5.0	0.5	40
Mo	Molybdenum	3.81	4.64	10	20	2.0	50
Na	Sodium	18.2	42.8	250	1000	100	500
Ni	Nickel	1.91	1.9	5.0	10	1.0	100
Pb	Lead	9.44	5.41	10	25	2.5	100
Sb	Antimony	12.6	25.4	50	100	10	20
Se	Selenium	30.6	34.7	60	100	10	20
SiO2	Silica	8.29	2.82	250	1000	100	100
Sr	Strontium	0.112	0.043	2.0	10	1.0	1.0
Ti	Titanium	0.468	0.098	5.0	20	2.0	10
Tl	Thallium	9.25	7.64	20	50	5.0	20
V	Vanadium	2.31	2.430	10	50	5.0	25
Zn	Zinc	2.61	3.55	10	20	2.0	200

ICP-OE * MDL determined: January & March 2013
Last Updated: March 2013

TechLaw

ESAT Region 8

Perkin Elmer ELAN DRC-II ICP-MS

2013 MDLs and PQLs
Contract: EP-W-06-33

2012	Dissolved MDL u g/L	Tot Rec. MDL u g/L	Practical MDL u g/L	PQL H20 ug/L	PQL Soil ug/Kg
Ag 107	0.02	0.01	0.10	0.5	50.0
Al 27	1.74	1.59	5.00	20.0	2000.0
As 75	0.35	0.23	0.50	2.0	200.0
Ba 135	0.11	0.11	5.00	10.0	1000.0
Be 9	0.05	0.09	0.10	0.2	20.0
Cd 111	0.01	0.03	0.10	0.2	20.0
Co 59	0.01	0.02	0.10	0.2	20.0
Cr 52	0.16	0.17	1.00	2.0	200.0
Cu 65	0.06	0.08	0.50	1.0	100.0
Mn 55	0.11	0.16	0.20	0.5	50.0
Mo 98	0.01	0.03	0.10	0.2	20.0
Ni 60	0.04	0.08	0.50	1.0	100.0
Pb 208	0.01	0.02	0.10	0.2	20.0
Sb 121	0.02	0.03	0.50	1.0	100.0
Se 82	1.06	1.64	2.00	2.0	200.0
Tl 205	0.01	0.01	0.50	1.0	100.0
Th 232	0.02	0.02	0.50	1.0	100.0
U 238	0.01	0.01	0.10	0.2	20.0
V 51	0.08	0.26	2.00	3.0	300.0
Zn 66	0.23	0.37	2.00	5.0	500.0

ICP-MS * MDL determined: March 2013

Last Updated: March 2013

TechLaw, Inc.
Environmental Services Assistance Team
16194 W. 45th Drive, Golden, CO 80403
303-312-7720

Task Order: 02
TDF: A-025
LIMS: C131107
DCN #: EP8-1-1053
Contract: EP-W-13-028

Rico-Argentine – Waters – NOV 2013

Sample Calculation for Hardness

Sample ID: C131107-31

Calcium (µg/L)			Ca Hardness, mg/L
248000	divide by 1000, then x 2.497	=	619.26

Magnesium (µg/L)			Mg Hardness, mg/L
27300	divide by 1000, then x 4.118	=	112.42

Calculated Hardness, mg/L	731.68

TechLaw, Inc.
Environmental Services Assistance Team
16194 W. 45th Drive, Golden, CO 80403
303-312-7720

Task Order: 02
TDF: A-025
LIMS: C131107
DCN #: EP8-1-1053
Contract: EP-W-13-028

Rico-Argentine – Waters – NOV 2013

Sample Identification
Cross-Reference Information

EPA Sample ID	ESAT LIMS ID
CHV-101U	C131107-01
CHV-101U	C131107-02
CHV-101U	C131107-03
DR-1	C131107-04
DR-1	C131107-05
DR-1	C131107-06
DR-2	C131107-07
DR-2	C131107-08
DR-3	C131107-09
DR-3	C131107-10
DR-3	C131107-11
DR-4	C131107-12
DR-4	C131107-13
DR-5	C131107-14
DR-5	C131107-15
DR-6	C131107-16
DR-6	C131107-17
DR-6	C131107-18
DR-7	C131107-19
DR-7	C131107-20
DR-7	C131107-21

Rico-Argentine – Waters – NOV 2013

Sample Identification
Cross-Reference Information

EPA Sample ID	ESAT LIMS ID
MW-109S	C131107-22
MW-109S	C131107-23
MW-109S	C131107-24
MW-110	C131107-25
MW-110	C131107-26
MW-110	C131107-27
MW-2D	C131107-28
MW-2D	C131107-29
MW-3D	C131107-30
MW-3D	C131107-31

USEPA
DateShipped: 11/14/2013
CarrierName: FedEx
AirbillNo:

A-025

CHAIN OF CUSTODY RECORD
Site #: 08BU
Contact Name: Jan Christner
Contact Phone: 505-269-1925

No: 8-111413-111939-0001
Cooler #:
Lab: ESAT
Lab Phone: 303-312-7798

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	08BU-0001	DR-1	Dissolved Metals	Surface Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0001	DR-1	Total Metals	Surface Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0001	DR-1	ESAT Anions	Surface Water	11/13/2013	1	500 mL poly	4 C	N
	08BU-0002	DR-2	Dissolved Metals	Surface Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0002	DR-2	Total Metals	Surface Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0003	DR-3	Dissolved Metals	Surface Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0003	DR-3	Total Metals	Surface Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0003	DR-3	ESAT Anions	Surface Water	11/13/2013	1	500 mL poly	4 C	N
	08BU-0004	DR-4	Dissolved Metals	Surface Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0004	DR-4	Total Metals	Surface Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0005	DR-5	Dissolved Metals	Surface Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0005	DR-5	Total Metals	Surface Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0006	DR-6	Dissolved Metals	Surface Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0006	DR-6	Total Metals	Surface Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0006	DR-6	ESAT Anions	Surface Water	11/13/2013	1	500 mL poly	4 C	N
	08BU-0007	DR-7	Dissolved Metals	Surface Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0007	DR-7	Total Metals	Surface Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0007	DR-7	ESAT Anions	Surface Water	11/13/2013	1	500 mL poly	4 C	N
	08BU-0008	MW-109S	Dissolved Metals	Ground Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N

Special Instructions:

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
	[signature]	11/14/13	Kelsey Bartley	11/15/13	10:50						

USEPA
DateShipped: 11/14/2013
CarrierName: FedEx
AirbillNo:

CHAIN OF CUSTODY RECORD
Site #: 08BU
Contact Name: Jan Christner
Contact Phone: 505-269-1925

No: 8-111413-111939-0001
Cooler #:
Lab: ESAT
Lab Phone: 303-312-7798

Lab #	Sample #	Location	Analyses	Matrix	Collected	Numb Cont	Container	Preservative	MS/MSD
	08BU-0008	MW-109S	Total Metals	Ground Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0008	MW-109S	ESAT Anions	Ground Water	11/13/2013	1	500 mL poly	4 C	N
	08BU-0009	MW-110	Dissolved Metals	Ground Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0009	MW-110	Total Metals	Ground Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0009	MW-110	ESAT Anions	Ground Water	11/13/2013	1	500 mL poly	4 C	N
	08BU-0010	CHV-101U	Dissolved Metals	Ground Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0010	CHV-101U	Total Metals	Ground Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0010	CHV-101U	ESAT Anions	Ground Water	11/13/2013	1	500 mL poly	4 C	N
	08BU-0011	MW-2D	Dissolved Metals	Ground Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0011	MW-2D	Total Metals	Ground Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0012	MW-3D	Dissolved Metals	Ground Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N
	08BU-0012	MW-3D	Total Metals	Ground Water	11/13/2013	1	500 mL poly	HNO3 pH<2	N

Special Instructions:

SAMPLES TRANSFERRED FROM
CHAIN OF CUSTODY #

Items/Reason	Relinquished by	Date	Received by	Date	Time	Items/Reason	Relinquished By	Date	Received by	Date	Time
	[signature]	11/14/13	[signature]	11/15/13	10:50						

C131107

ESAT Technical Direction Form

Contract No. EPW13028
EPA Region 8

Site ID: 08BU
TDF ID: A-025

Date Issued: 11/12/2013
Date Updated:

Date Closed By:

Name: Rico Argentine 2014 Analytical Support NOW

Details: The Contractor shall analyze approximately 12 surface water samples collected from the Rico Argentine St. Louis Tunnel Superfund site as indicated in the Analytical Information Section. The samples will be collected by the R8 START Contractor Weston Solutions (Jan Christner) and sent to the ESAT R8 Lab the week ending 11/22/13.

TO02/Subtask 02b: Inorganic Chemistry

The site RPM is Steve Way.

Analytical Information:

MATRIX
☑ Water ☐ Soils ☐ Vegetation ☐ Biota

WET CHEM
☐ TSS ☐ TDS ☐ DOC ☐ Alk ☑ Chloride ☑ Sulfate ☑ Fluoride ☑ Nitrate ☑ Nitrite
Other Report as combined NO2-NO3

METALS
☑ Dissolved ☑ Total Recoverable ☐ Total ☑ Hardness (Calc)
200.7: ☐ Ag ☒ Al ☐ As ☐ Ba ☒ Be ☐ B ☑ Ca ☐ Cd ☐ Co ☐ Cr ☐ Cu ☑ Fe ☑ K ☑ Mg
☒ Mn ☐ Mo ☑ Na ☐ Ni ☐ Pb ☐ Sb ☐ Se ☐ Sr ☐ Ti ☐ Tl ☐ V ☒ Zn ☐ SiO2
200.8: ☑ Ag ☑ Al ☑ As ☑ Ba ☑ Be ☑ Cd ☑ Co ☑ Cr ☑ Cu ☑ Mn ☑ Mo ☑ Ni ☑ Pb ☑ Sb
☑ Se ☑ Th ☑ Tl ☑ U ☑ V ☑ Zn
7470/7471/747 ☐ Hg

12/10/13

FIBERS
☐ PLM ☐ TEM

Deliverables

ID	*Description*	*Due Date*	*Submission Date*
1	Provide final deliverable package to Task Monitor no later than 30 days after delivery of samples.		

11/12/13

TechLaw, Inc.
Environmental Services Assistance Team
16194 W. 45th Drive, Golden, CO 80403
303-312-7721

Contract: EP-W-13-028

Certificates of Analysis

Valid through January 2014

Perkin Elmer Optima ICP-OE

Perkin Elmer ELAN ICP-MS

NIPPON NIC MA2000

Perkin Elmer FIMS 100

Anions by Ion Chromatography

TSS / TDS

Dissolved Organic Carbon

Alkalinity

- Initial Calibration Verification (ICV) Standards
- Laboratory Check Standards (LCS)
- Matrix Spike Solutions
- Interference Check (ICSA / AB) Standards

TechLaw, Inc.
Environmental Services Assistance Team
16194 W. 45th Drive, Golden, CO 80403
303-312-7721

Contract: EP-W-13-028

Certificates of Analysis

Valid through January 2014

Anions by Ion Chromatography

TSS / TDS

Dissolved Organic Carbon

Alkalinity

- Initial Calibration Verification (ICV) Standards
- Laboratory Check Standards (LCS)
- Matrix Spike Solutions

INORGANIC™ VENTURES
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

QC ALUMINUM STD IK PPM IN 2% NH
130125B

tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 DESCRIPTION OF CRM — 1000 µg/mL Aluminum in 3% (v/v) HNO3

Catalog Number:	CGAL1-1, CGAL1-2, and CGAL1-5
Lot Number:	**F2-AL04110**
Starting Material:	Al ingot
Starting Material Purity (%):	99.9980
Starting Material Lot No:	1502
Matrix:	3% (v/v) HNO3

Expires
1-Feb-2014

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 1,002 ± 5 µg/mL - weighted mean

Certified Density: 1.019 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\Sigma x_i}{n}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

Uncertainty $(\pm) = 2\,[\,\Sigma(s_i)^2\,]^{1/2}$

2 = the coverage factor.
$[\,\Sigma(s_i)^2\,]^{1/2}$ = The square root of the sum of the squares of the most common errors (where 's' stands for the standard deviation) from instrumental measurement, density, NIST SRM uncertainty, weighing, dilution to volume, homogeneity, long term stability and short term stability.

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **1,001 ± 3 µg/mL**
ICP Assay NIST SRM 3101a Lot Number: 060502

Assay Method #2 **1,004 ± 3 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

INORGANIC VENTURES™
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

QC ARSENIC STD 1K PPM IN 1.4% NIT
130125D

CERTIFICATE OF ANALYSIS

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info@inorganicventures.com

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ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 DESCRIPTION OF CRM

1000 µg/mL Arsenic in 2% (v/v) HNO3

Catalog Number:	CGAS1-1, CGAS1-2, and CGAS1-5
Lot Number:	**F2-AS02083**
Starting Material:	As pieces
Starting Material Purity (%):	99.9996
Starting Material Lot No:	1665
Matrix:	2% (v/v) HNO3

Expires
1-Feb-2014

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 1,001 ± 5 µg/mL - no weighted mean

Certified Density: 1.010 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\Sigma x_i}{n}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

Uncertainty (±) = $2\,[\,\Sigma(s_i)^2\,]^{1/2}$

2 = the coverage factor.
$[\,\Sigma(s_i)^2\,]^{1/2}$ = The square root of the sum of the squares of the most common errors (where 's' stands for the standard deviation) from instrumental measurement, density, NIST SRM uncertainty, weighing, dilution to volume, homogeneity, long term stability and short term stability.

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **1,001 ± 3 µg/mL**
ICP Assay NIST SRM 3103a Lot Number: 100818

Assay Method #2 **1,000 ± 3 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

INORGANIC VENTURES™
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

QC BARIUM STD IN PPM IN 1% NH
130125E

tel: 800.669.6799 • 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 DESCRIPTION OF CRM — 1000 µg/mL Barium in 0.1% (v/v) HNO3

Catalog Number:	CGBA1-1, CGBA1-2, and CGBA1-5
Lot Number:	**E2-BA02066**
Starting Material:	Ba(NO3)2
Starting Material Purity (%):	99.9998
Starting Material Lot No:	1514_1599
Matrix:	0.1% (v/v) HNO3

Expires
1-Feb-2014

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 997 ± 6 µg/mL - weighted mean

Certified Density: 1.000 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

$$\text{Certified Value } (\bar{x}) = \frac{\Sigma x_i}{n}$$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

$$\text{Uncertainty } (\pm) = \frac{2\,[(\Sigma s_i)^2]^{1/2}}{(n)^{1/2}}$$

Σs_i = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **997 ± 4 µg/mL**
ICP Assay NIST SRM 3104a Lot Number: 070222

Assay Method #2 **996 ± 3 µg/mL**
Gravimetric NIST SRM Lot Number: See Sec. 4.2

INORGANIC VENTURES™
300 Technology Drive
Christiansburg, VA 24073 • USA
inorganicventures.com

QC BERYLLIUM STD IK PPM IN 2% NI
130125F

CERTIFICATE OF ANALYSIS

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fax: 540.585.3012
info@inorganicventures.com

1.0 **INORGANIC VENTURES** is an ISO Guide 34 "General Requirements for the Competence of Reference Material Producers" and ISO 9001 registered manufacturer. Our manufacturing laboratory is accredited to ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories."

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 DESCRIPTION OF CRM — 1000 µg/mL Beryllium in 3% (v/v) HNO3

Catalog Number:	CGBE1-1, CGBE1-2, and CGBE1-5
Lot Number:	**F2-BE02018**
Starting Material:	Be4O(OOCCH3)6
Starting Material Purity (%):	100.0000
Starting Material Lot No:	1671
Matrix:	3% (v/v) HNO3

Expires
1-Feb-2014

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 1,002 ± 4 µg/mL - weighted mean

Certified Density: 1.021 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\Sigma x_i}{n}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

Uncertainty (±) $= 2\,[\,\Sigma(s_i)^2\,]^{1/2}$

2 = the coverage factor.
$[\,\Sigma(s_i)^2\,]^{1/2}$ = The square root of the sum of the squares of the most common errors (where 's' stands for the standard deviation) from instrumental measurement, density, NIST SRM uncertainty, weighing, dilution to volume, homogeneity, long term stability and short term stability.

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **1,002 ± 4 µg/mL**
ICP Assay NIST SRM 3105a Lot Number: 090514

Assay Method #2 **1,002 ± 3 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

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QC BORON STD 1K PPM IN H2O
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ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 DESCRIPTION OF CRM — 1000 µg/mL Boron in H2O / tr. NH4OH

Catalog Number:	CGB1-1, CGB1-2, and CGB1-5
Lot Number:	**E2-B02103**
Starting Material:	H3BO3
Starting Material Purity (%):	100.0000
Starting Material Lot No:	OV0133 EF178
Matrix:	H2O / tr. NH4OH

Expires
1-Feb-2014

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 1,002 ± 5 µg/mL - weighted mean

Certified Density: 1.001 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\Sigma x_i}{n}$

Uncertainty $(\pm) = \frac{2\,[(\Sigma s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
Σs_i = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **1,004 ± 3 µg/mL**
ICP Assay NIST SRM 3107 Lot Number: 070514

Assay Method #2 **1,000 ± 3 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

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2.0 DESCRIPTION OF CRM — 1000 µg/mL Calcium in 0.1% (v/v) HNO3

Catalog Number:	CGCA1-1, CGCA1-2, and CGCA1-5
Lot Number:	**E2-CA04030**
Starting Material:	CaO
Starting Material Purity (%):	99.9982
Starting Material Lot No:	1478
Matrix:	0.1% (v/v) HNO3

Expires
1-Feb-2014

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 998 ± 5 µg/mL - weighted mean

Certified Density: 1.002 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\Sigma x_i}{n}$

Uncertainty $(\pm) = \frac{2\,[(\Sigma s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
Σs_i = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **999 ± 3 µg/mL**
ICP Assay NIST SRM 3109a Lot Number: 050825

Assay Method #2 **997 ± 3 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

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ACCREDITED Reference Material Producer Certificate 883.02

2.0 DESCRIPTION OF CRM — 10000 µg/mL Calcium in 2% (v/v) HNO3

Catalog Number:	CGCA10-1, CGCA10-2, and CGCA10-5
Lot Number:	**F2-CA04043**
Starting Material:	CaO
Starting Material Purity (%):	99.9980
Starting Material Lot No:	1635
Matrix:	2% (v/v) HNO3

Expires
1-Feb-2014

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 10,025 ± 56 µg/mL - weighted mean

Certified Density: 1.039 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\Sigma x_i}{n}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

Uncertainty (±) = $2\,[\,\Sigma(s_i)^2\,]^{1/2}$

2 = the coverage factor.
$[\,\Sigma(s_i)^2\,]^{1/2}$ = The square root of the sum of the squares of the most common errors (where 's' stands for the standard deviation) from instrumental measurement, density, NIST SRM uncertainty, weighing, dilution to volume, homogeneity, long term stability and short term stability.

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **10,026 ± 41 µg/mL**
ICP Assay NIST SRM 3109a Lot Number: 050825

Assay Method #2 **10,022 ± 25 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

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ACCREDITED Reference Material Producer Certificate 883.02

2.0 DESCRIPTION OF CRM — 1000 µg/mL Cadmium in 3% (v/v) HNO3

Catalog Number:	CGCD1-1, CGCD1-2, and CGCD1-5
Lot Number:	**F2-CD02035**
Starting Material:	Cd shot
Starting Material Purity (%):	100.0000
Starting Material Lot No:	1542
Matrix:	3% (v/v) HNO3

Expires
1-Feb-2014

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 1,003 ± 5 µg/mL - weighted mean

Certified Density: 1.016 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

$$\text{Certified Value } (\bar{x}) = \frac{\Sigma x_i}{n}$$

$$\text{Uncertainty } (\pm) = \frac{2\,[(\Sigma s_i)^2]^{1/2}}{(n)^{1/2}}$$

($\bar{x}$) = mean
x_i = individual results
n = number of measurements
Σs_i = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

· "Property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons all having stated uncertainties." (ISO VIM, 2nd ed., 1993, definition 6.10)

· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **1,000 ± 3 µg/mL**
ICP Assay NIST SRM 3108 Lot Number: 060531

Assay Method #2 **1,005 ± 3 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

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QC COBALT STD IN PPM IN 2% NTT
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ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** **1000 µg/mL Cobalt in 3% (v/v) HNO3**

Catalog Number:	CGCO1-1, CGCO1-2, and CGCO1-5
Lot Number:	**F2-CO02044**
Starting Material:	Co powder
Starting Material Purity (%):	99.9995
Starting Material Lot No:	1640
Matrix:	3% (v/v) HNO3

Expires
1-Feb-2014

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 996 ± 5 µg/mL - weighted mean

Certified Density: 1.018 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\Sigma x_i}{n}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements

Uncertainty (±) = $2\,[\Sigma(s_i)^2]^{1/2}$

2 = the coverage factor.
$[\Sigma(s_i)^2]^{1/2}$ = The square root of the sum of the squares of the most common errors (where 's' stands for the standard deviation) from instrumental measurement, density, NIST SRM uncertainty, weighing, dilution to volume, homogeneity, long term stability and short term stability.

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

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· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **995 ± 3 µg/mL**
ICP Assay NIST SRM 3113 Lot Number: 00630

Assay Method #2 **997 ± 3 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

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ACCREDITED Reference Material Producer Certificate 883.02

2.0 DESCRIPTION OF CRM — 1000 µg/mL Copper in 3% (v/v) HNO3

Catalog Number:	CGCU1-1, CGCU1-2, and CGCU1-5
Lot Number:	**E2-CU02130**
Starting Material:	Cu shot
Starting Material Purity (%):	100.0000
Starting Material Lot No:	1612
Matrix:	3% (v/v) HNO3

Expires
1-Feb-2014

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Concentration: 1,002 ± 5 µg/mL - weighted mean

Certified Density: 1.016 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

$$\text{Certified Value } (\bar{x}) = \frac{\sum x_i}{n}$$

$$\text{Uncertainty } (\pm) = \frac{2\,[(\sum s_i)^2]^{1/2}}{(n)^{1/2}}$$

($\bar{x}$) = mean
x_i = individual results
n = number of measurements
$\sum s_i$ = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS

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· This product is Traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRMs are available, the term 'in-house std.' is specified.

4.1 **Assay Method #1** **1,001 ± 3 µg/mL**
ICP Assay NIST SRM 3114 Lot Number: 011017

Assay Method #2 **1,003 ± 3 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

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ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 **DESCRIPTION OF CRM** **1000 µg/mL Chromium (+3) in 2% (v/v) HNO3**

Catalog Number:	CGCR(3)1-1, CGCR(3)1-2, and CGCR(3)1-5
Lot Number:	**E2-CR03060**
Starting Material:	Cr pieces
Starting Material Purity (%):	99.9958
Starting Material Lot No:	1604
Matrix:	2% (v/v) HNO3

Expires
1-Feb-2014

3.0 **CERTIFIED VALUES AND UNCERTAINTIES**

Certified Concentration: 998 ± 5 µg/mL - weighted mean

Certified Density: 1.011 g/mL (measured at 20 ± 1°C)

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Certified Value $(\bar{x}) = \frac{\Sigma x_i}{n}$

Uncertainty $(\pm) = \frac{2\,[(\Sigma s_i)^2]^{1/2}}{(n)^{1/2}}$

$(\bar{x})$ = mean
x_i = individual results
n = number of measurements
Σs_i = The summation of all significant estimated errors (Most common are the errors from instrumental measurement, weighing, dilution to volume and the fixed error reported on the NIST SRM certificate of analysis)

4.0 **TRACEABILITY TO NIST AND VALUES OBTAINED BY INDEPENDENT METHODS**

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4.1 **Assay Method #1** **997 ± 3 µg/mL**
ICP Assay NIST SRM 3112a Lot Number: 030730

Assay Method #2 **998 ± 3 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2