



Environmental Division

Certificate of Analysis

CASH CLIENTS - CALGARY
ATTN: JASON BRANDT
1044 BENCHLANDS TRAIL
CANMORE AB

Report Date: 04-NOV-09 14:33 (MT)
Version: FINAL REV. 2

Lab Work Order #: **L833524**

Date Received: **23-OCT-09**

Project P.O. #:
Job Reference:
Legal Site Desc:
CofC Numbers: 09-049936

Other Information:

Comments: ADDITIONAL 04-NOV-09 09:14
ADDITIONAL 04-NOV-09 09:14
added missing Fluoride result

Victoria Blaire Robicheau
Account Manager

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN AUTHORITY OF THE LABORATORY.
ALL SAMPLES WILL BE DISPOSED OF AFTER 30 DAYS FOLLOWING ANALYSIS. PLEASE CONTACT THE LAB IF YOU
REQUIRE ADDITIONAL SAMPLE STORAGE TIME.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L833524-1 REMINERALIZED							
Sampled By: JASOU BRANDT on 23-OCT-09							
Matrix: WATER							
Total Metals							
Total Metals in Water by ICPMS							
Aluminum (Al)-Total	<0.010		0.010	mg/L		28-OCT-09	R1026350
Barium (Ba)-Total	0.0015		0.0010	mg/L		28-OCT-09	R1026350
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		28-OCT-09	R1026350
Boron (B)-Total	0.123		0.050	mg/L		28-OCT-09	R1026350
Cadmium (Cd)-Total	<0.00020		0.00020	mg/L		28-OCT-09	R1026350
Chromium (Cr)-Total	<0.0010		0.0010	mg/L		28-OCT-09	R1026350
Cobalt (Co)-Total	<0.0010		0.0010	mg/L		28-OCT-09	R1026350
Copper (Cu)-Total	<0.0010		0.0010	mg/L		28-OCT-09	R1026350
Lead (Pb)-Total	<0.0010		0.0010	mg/L		28-OCT-09	R1026350
Manganese (Mn)-Total	<0.0010		0.0010	mg/L		28-OCT-09	R1026350
Molybdenum (Mo)-Total	<0.0010		0.0010	mg/L		28-OCT-09	R1026350
Nickel (Ni)-Total	<0.0010		0.0010	mg/L		28-OCT-09	R1026350
Silver (Ag)-Total	<0.00010		0.00010	mg/L		28-OCT-09	R1026350
Strontium (Sr)-Total	0.0017		0.0010	mg/L		28-OCT-09	R1026350
Thallium (Tl)-Total	<0.0010		0.0010	mg/L		28-OCT-09	R1026350
Tin (Sn)-Total	<0.0010		0.0010	mg/L		28-OCT-09	R1026350
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		28-OCT-09	R1026350
Vanadium (V)-Total	<0.0050		0.0050	mg/L		28-OCT-09	R1026350
Zinc (Zn)-Total	<0.0050		0.0050	mg/L		28-OCT-09	R1026350
Total Metals in Water by ICPOES							
Calcium (Ca)-Total	0.101		0.050	mg/L		27-OCT-09	R1018316
Iron (Fe)-Total	<0.030		0.030	mg/L		27-OCT-09	R1018316
Magnesium (Mg)-Total	16.4		0.10	mg/L		27-OCT-09	R1018316
Potassium (K)-Total	1.07		0.50	mg/L		27-OCT-09	R1018316
Sodium (Na)-Total	1.4		1.0	mg/L		27-OCT-09	R1018316
Miscellaneous Parameters							
Fluoride (F)	<0.10		0.10	mg/L		26-OCT-09	R1017183
Routine Water Analysis							
Chloride (Cl)							
Chloride (Cl)	45.0		0.10	mg/L		26-OCT-09	R1017183
Dissolved Metals by ICPOES							
Calcium (Ca)-Dissolved	0.161		0.050	mg/L		27-OCT-09	R1018316
Magnesium (Mg)-Dissolved	16.7		0.10	mg/L		27-OCT-09	R1018316
Potassium (K)-Dissolved	1.04		0.50	mg/L		27-OCT-09	R1018316
Sodium (Na)-Dissolved	1.4		1.0	mg/L		27-OCT-09	R1018316
Ion Balance Calculation							
Ion Balance	100			%		28-OCT-09	
TDS (Calculated)	71.5			mg/L		28-OCT-09	
Hardness (as CaCO3)	69.2			mg/L		28-OCT-09	
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.071		0.071	mg/L		27-OCT-09	
Nitrate-N							
Nitrate-N	<0.050		0.050	mg/L		26-OCT-09	R1017183
Nitrite-N							
Nitrite-N	<0.050		0.050	mg/L		26-OCT-09	R1017183
Sulfate (SO4)							
Sulphate (SO4)	3.33		0.50	mg/L		26-OCT-09	R1017183
pH, Conductivity and Total Alkalinity							
pH	7.27		0.10	pH		26-OCT-09	R1020663
Conductivity (EC)	169		3.0	uS/cm		26-OCT-09	R1020663
Bicarbonate (HCO3)	7.9		5.0	mg/L		26-OCT-09	R1020663

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS LABORATORY GROUP ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L833524-1 REMINERALIZED Sampled By: JASOU BRANDT on 23-OCT-09 Matrix: WATER							
pH, Conductivity and Total Alkalinity Carbonate (CO3)	<5.0		5.0	mg/L		26-OCT-09	R1020663
Hydroxide (OH)	<5.0		5.0	mg/L		26-OCT-09	R1020663
Alkalinity, Total (as CaCO3)	6.4		5.0	mg/L		26-OCT-09	R1020663

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CL-CL	Water	Chloride (Cl)	APHA 4110 B-Ion Chromatography
Inorganic Anions by ion chromatography (IC) in water and aqueous extracts of soils.			
F-IC-CL	Water	Fluoride	APHA 4110 B-Ion Chromatography
IONBALANCE-CL	Water	Ion Balance Calculation	APHA 1030E
MET-DIS-ICP-CL	Water	Dissolved Metals by ICPOES	EPA SW-846 3005A/6010B
his analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-ICP-CL	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion using a hotblock (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-TOT-MS-CL	Water	Total Metals in Water by ICPMS	EPA SW-846 3005A/6020A
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
N2N3-CALC-CL	Water	Nitrate+Nitrite	CALCULATION
NO2-CL	Water	Nitrite-N	APHA 4110 B-Ion Chromatography
NO3-IC-CL	Water	Nitrate-N	APHA 4110 B-Ion Chromatography
PH/EC/ALK-CL	Water	pH, Conductivity and Total Alkalinity	APHA 4500H,2510,2320
pH measurement is determined from the activity of the hydrogen ions using a hydrogen electrode and a reference electrode Alkalinity measurement is based on the sample's capacity to neutralize acid Conductivity measurement is based on the sample's capacity to convey an electric current			
SO4-CL	Water	Sulfate (SO4)	APHA 4110 B-Ion Chromatography

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA

Chain of Custody Numbers:

09-049936

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mk/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



L833524

Environmental Division

Report To		Report Format / Distribution		Service Requested: (Rush subject to availability)			
Company: <u>Aqua Service</u>		Standard: <u>Other</u> (specify):		<input checked="" type="checkbox"/> Regular (Standard Turnaround Times)			
Contact: <u>Jason Brandt</u>		Select: PDF <input checked="" type="checkbox"/> Excel <input type="checkbox"/> Digital <input type="checkbox"/> Fax <input type="checkbox"/>		Priority, Date Req'd: _____ (Surcharges apply)			
Address: <u>1044 Benchlands Trail</u> <u>Canmore AB</u>		Email 1: <u>jason@aquaservice.ca</u>		Emergency (1 Business Day) - 100% Surcharge			
Phone: <u>403 609-2154</u> Fax: <u>403 678-6929</u>		Email 2: _____		For Emergency < 1 Day, ASAP or Weekend - Contact ALS			

Invoice To Same as Report? (circle Yes or No (if No, provide details))		Client / Project Information		Analysis Request																																																																																														
Copy of Invoice with Report? (circle Yes or No)		Job #:		(Indicate Filtered or Preserved, F/P)																																																																																														
Company:		PO / AFE:		<table border="1"> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td rowspan="4" style="writing-mode: vertical-rl; text-orientation: mixed;">Routine Total Metals</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>																						Routine Total Metals																																																																								
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Lab Work Order # (lab use only)	ALS Contact:	Sampler: <u>Jason Brandt</u>
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Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
1	Remineralized	23/10/09			
2	Remineralized	23/10/09			

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by: <u>[Signature]</u>	Date:	Time:	Received by: <u>[Signature]</u>	Date: <u>23-Oct-09</u>	Time: <u>15:30</u>	Temperature: <u>15.0C</u>	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF