



CERTIFICATE OF ANALYSIS

REPORTED TO Sechelt, District of
PO Box 129, 2nd Floor, 5797 Cowrie Street
Sechelt, BC V0N 3A0

ATTENTION Christine Miller

PO NUMBER
PROJECT WRC
PROJECT INFO

WORK ORDER 8083022

RECEIVED / TEMP 2018-08-31 14:25 / 12°C
REPORTED 2018-09-04 18:07

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO 17025:2005 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks



You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry



It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve



Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

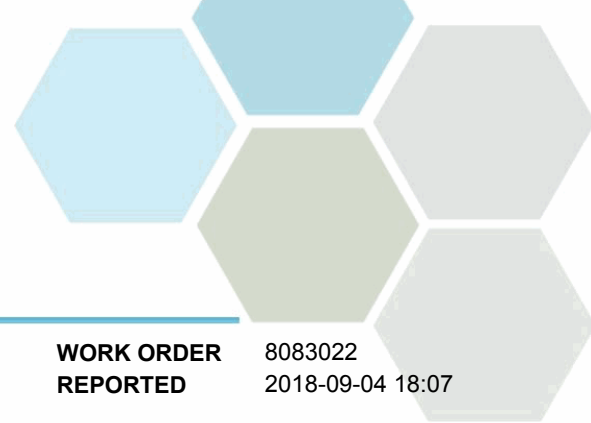
If you have any questions or concerns, please contact me at hmaleki@caro.ca

Authorized By:

Helen Maleki, Dipl T
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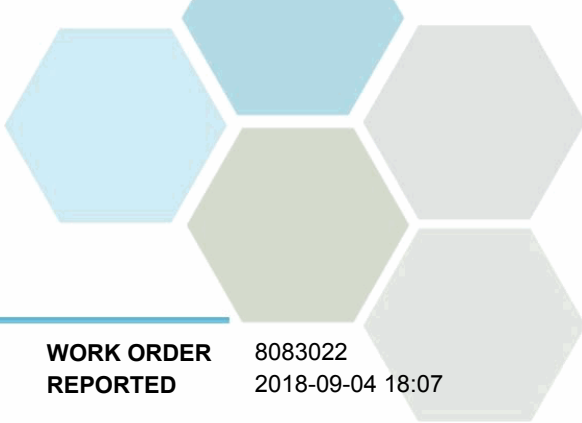


TEST RESULTS

REPORTED TO PROJECT Sechelt, District of WRC

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Analyte	Result	RL	Units	Analyzed	Qualifier
Ground Water (8083022-01) Matrix: Water Sampled: 2018-08-31					CT1, F2
Anions					
Chloride	22.3	0.10	mg/L	2018-09-03	
Fluoride	< 0.10	0.10	mg/L	2018-09-03	
Nitrate (as N)	0.846	0.010	mg/L	2018-09-03	
Nitrite (as N)	< 0.010	0.010	mg/L	2018-09-03	
Sulfate	4.6	1.0	mg/L	2018-09-03	
General Parameters					
Alkalinity, Total (as CaCO ₃)	24.7	1.0	mg/L	2018-09-04	
Alkalinity, Phenolphthalein (as CaCO ₃)	< 1.0	1.0	mg/L	2018-09-04	
Alkalinity, Bicarbonate (as CaCO ₃)	24.7	1.0	mg/L	2018-09-04	
Alkalinity, Carbonate (as CaCO ₃)	< 1.0	1.0	mg/L	2018-09-04	
Alkalinity, Hydroxide (as CaCO ₃)	< 1.0	1.0	mg/L	2018-09-04	
Colour, True	7.2	5.0	CU	2018-09-01	
Conductivity (EC)	140	2.0	µS/cm	2018-09-04	
Cyanide, Total	< 0.0020	0.0020	mg/L	2018-09-04	
pH	6.23	0.10	pH units	2018-09-04	HT2
Temperature, at pH	22.0		°C	2018-09-04	HT2
Turbidity	11.5	0.10	NTU	2018-09-01	
Calculated Parameters					
Hardness, Total (as CaCO ₃)	27.2	0.500	mg/L	N/A	
Langelier Index	-2.9	-5.0	-	2018-09-04	
Solids, Total Dissolved	70.8	1.00	mg/L	N/A	
Total Metals					
Aluminum, total	< 0.0050	0.0050	mg/L	2018-09-02	
Antimony, total	< 0.00020	0.00020	mg/L	2018-09-02	
Arsenic, total	< 0.00050	0.00050	mg/L	2018-09-02	
Barium, total	0.0160	0.0050	mg/L	2018-09-02	
Boron, total	0.0217	0.0050	mg/L	2018-09-02	
Cadmium, total	0.000019	0.000010	mg/L	2018-09-02	
Calcium, total	8.99	0.20	mg/L	2018-09-02	
Chromium, total	< 0.00050	0.00050	mg/L	2018-09-02	
Cobalt, total	< 0.00010	0.00010	mg/L	2018-09-02	
Copper, total	0.00349	0.00040	mg/L	2018-09-02	
Iron, total	2.39	0.010	mg/L	2018-09-02	
Lead, total	0.00141	0.00020	mg/L	2018-09-02	
Magnesium, total	1.16	0.010	mg/L	2018-09-02	
Manganese, total	0.0263	0.00020	mg/L	2018-09-02	
Mercury, total	< 0.000040	0.000040	mg/L	2018-09-02	CT5
Molybdenum, total	< 0.00010	0.00010	mg/L	2018-09-02	
Nickel, total	0.00132	0.00040	mg/L	2018-09-02	
Potassium, total	0.61	0.10	mg/L	2018-09-02	



TEST RESULTS

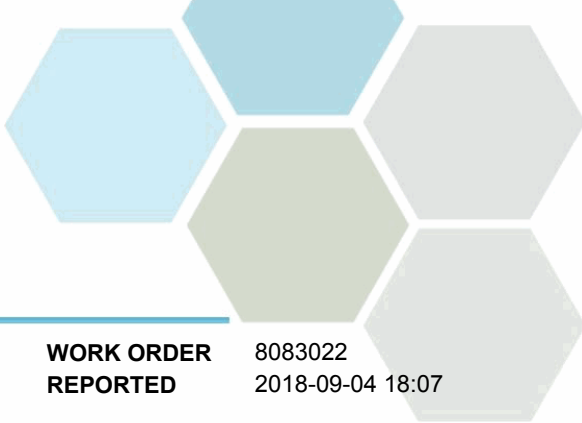
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Analyte	Result	RL	Units	Analyzed	Qualifier
Ground Water (8083022-01) Matrix: Water Sampled: 2018-08-31, Continued					CT1, F2
Total Metals, Continued					
Selenium, total	< 0.00050	0.00050	mg/L	2018-09-02	
Sodium, total	14.3	0.10	mg/L	2018-09-02	
Strontium, total	0.0807	0.0010	mg/L	2018-09-02	
Uranium, total	< 0.000020	0.000020	mg/L	2018-09-02	
Zinc, total	0.122	0.0040	mg/L	2018-09-02	
Microbiological Parameters					
Coliforms, Total (MPN)	9.2	3.0	MPN/100 mL	2018-09-01	
E. coli (MPN)	1.1	3.0	MPN/100 mL	2018-09-01	

Sample Qualifiers:

- CT1 Incorrect Container(s) supplied for CN analysis
- CT5 This sample has been incorrectly preserved for Mercury analysis
- F2 The sample was not field-preserved with HNO3 and was therefore preserved in the laboratory and held for at least 16 hours prior to analysis for total metals.
- HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.



APPENDIX 1: SUPPORTING INFORMATION

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Analysis Description	Method Ref.	Technique	Location
Alkalinity in Water	SM 2320 B* (2011)	Titration with H2SO4	Kelowna
Anions in Water	SM 4110 B (2011)	Ion Chromatography	Kelowna
Coliforms, Total in Water	SM 9221 B (2006)	Most Probable Number / Multiple-Tube Fermentation	Kelowna
Colour, True in Water	SM 2120 C (2011)	Spectrophotometry (456 nm)	Kelowna
Conductivity in Water	SM 2510 B (2011)	Conductivity Meter	Kelowna
Cyanide, SAD in Water	ASTM D7511-12	Flow Injection with In-Line UV Digestion and Amperometry	Kelowna
E. coli in Water	SM 9221 (2006)	Most Probable Number / Multiple-Tube Fermentation	Kelowna
Hardness in Water	SM 2340 B* (2011)	Calculation: 2.497 [total Ca] + 4.118 [total Mg] (Est)	N/A
Langelier Index in Water	SM 2330 B (2010)	Calculation	N/A
pH in Water	SM 4500-H+ B (2011)	Electrometry	Kelowna
Solids, Total Dissolved in Water	SM 1030 E (2011)	Calculation: 100 x ([Cations]-[Anions])/([Cations]+[Anions])	N/A
Total Metals in Water	EPA 200.2* / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond
Turbidity in Water	SM 2130 B (2011)	Nephelometry	Kelowna

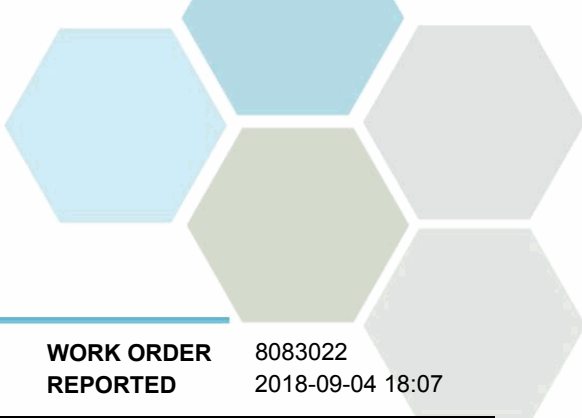
Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
°C	Degrees Celcius
CU	Colour Units (referenced against a platinum cobalt standard)
mg/L	Milligrams per litre
MPN/100 mL	Most Probable Number per 100 millilitres
NTU	Nephelometric Turbidity Units
pH units	pH < 7 = acidic, pH > 7 = basic
µS/cm	Microsiemens per centimetre
ASTM	ASTM International Test Methods
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.



APPENDIX 2: QUALITY CONTROL RESULTS

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The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in “batches” and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk):** A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup):** An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS):** A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS):** A second aliquot of sample is fortified with with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM):** A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
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Anions, Batch B8I0022

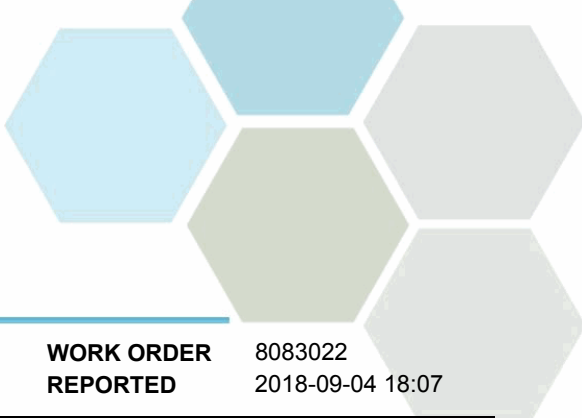
LCS (B8I0022-BS1)			Prepared: 2018-09-03, Analyzed: 2018-09-03						
Chloride	16.6	0.10 mg/L	16.0		104	90-110			
Fluoride	3.70	0.10 mg/L	4.00		92	88-108			
Nitrate (as N)	4.18	0.010 mg/L	4.00		105	93-108			
Nitrite (as N)	2.01	0.010 mg/L	2.00		100	85-114			
Sulfate	16.1	1.0 mg/L	16.0		101	91-109			

General Parameters, Batch B8I0003

Blank (B8I0003-BLK1)			Prepared: 2018-09-01, Analyzed: 2018-09-01						
Turbidity	< 0.10	0.10 NTU							
Blank (B8I0003-BLK2)			Prepared: 2018-09-01, Analyzed: 2018-09-01						
Turbidity	< 0.10	0.10 NTU							
LCS (B8I0003-BS1)			Prepared: 2018-09-01, Analyzed: 2018-09-01						
Turbidity	40.8	0.10 NTU	40.0		102	90-110			
LCS (B8I0003-BS2)			Prepared: 2018-09-01, Analyzed: 2018-09-01						
Turbidity	40.1	0.10 NTU	40.0		100	90-110			
Duplicate (B8I0003-DUP2)			Source: 8083022-01 Prepared: 2018-09-01, Analyzed: 2018-09-01						
Turbidity	11.6	0.10 NTU		11.5			< 1	15	

General Parameters, Batch B8I0004

Blank (B8I0004-BLK1)			Prepared: 2018-09-01, Analyzed: 2018-09-01						
Colour, True	< 5.0	5.0 CU							
LCS (B8I0004-BS1)			Prepared: 2018-09-01, Analyzed: 2018-09-01						
Colour, True	10	5.0 CU	10.0		100	85-115			
Duplicate (B8I0004-DUP1)			Source: 8083022-01 Prepared: 2018-09-01, Analyzed: 2018-09-01						
Colour, True	7.1	5.0 CU		7.2				15	

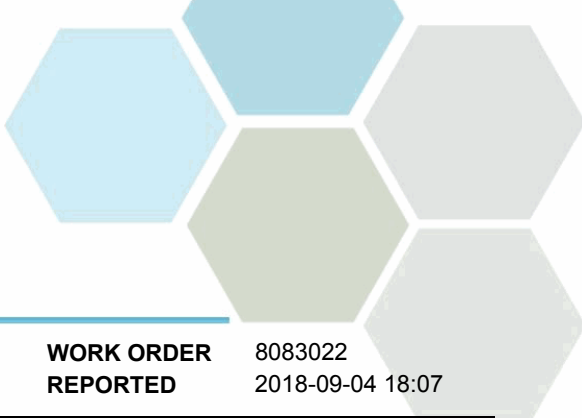


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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B8I0057									
Blank (B8I0057-BLK1)			Prepared: 2018-09-04, Analyzed: 2018-09-04						
Cyanide, Total	< 0.0020	0.0020 mg/L							
LCS (B8I0057-BS1)			Prepared: 2018-09-04, Analyzed: 2018-09-04						
Cyanide, Total	0.0191	0.0020 mg/L	0.0200		96	82-120			
LCS Dup (B8I0057-BSD1)			Prepared: 2018-09-04, Analyzed: 2018-09-04						
Cyanide, Total	0.0207	0.0020 mg/L	0.0200		104	82-120	8	10	
Microbiological Parameters, Batch B8I0008									
Blank (B8I0008-BLK1)			Prepared: 2018-09-01, Analyzed: 2018-09-01						
Coliforms, Total (MPN)	< 3.0	3.0 MPN/100 mL							
E. coli (MPN)	< 3.0	3.0 MPN/100 mL							
Blank (B8I0008-BLK2)			Prepared: 2018-09-01, Analyzed: 2018-09-01						
Coliforms, Total (MPN)	< 1.1	1.1 MPN/100 mL							
E. coli (MPN)	< 1.1	1.1 MPN/100 mL							
Total Metals, Batch B8I0032									
Blank (B8I0032-BLK1)			Prepared: 2018-09-02, Analyzed: 2018-09-02						
Aluminum, total	< 0.0050	0.0050 mg/L							
Antimony, total	< 0.00020	0.00020 mg/L							
Arsenic, total	< 0.00050	0.00050 mg/L							
Barium, total	< 0.0050	0.0050 mg/L							
Boron, total	< 0.0050	0.0050 mg/L							
Cadmium, total	< 0.000010	0.000010 mg/L							
Calcium, total	< 0.20	0.20 mg/L							
Chromium, total	< 0.00050	0.00050 mg/L							
Cobalt, total	< 0.00010	0.00010 mg/L							
Copper, total	< 0.00040	0.00040 mg/L							
Iron, total	< 0.010	0.010 mg/L							
Lead, total	< 0.00020	0.00020 mg/L							
Magnesium, total	< 0.010	0.010 mg/L							
Manganese, total	< 0.00020	0.00020 mg/L							
Mercury, total	< 0.000040	0.000040 mg/L							
Molybdenum, total	< 0.00010	0.00010 mg/L							
Nickel, total	< 0.00040	0.00040 mg/L							
Potassium, total	< 0.10	0.10 mg/L							
Selenium, total	< 0.00050	0.00050 mg/L							
Sodium, total	< 0.10	0.10 mg/L							
Strontium, total	< 0.0010	0.0010 mg/L							
Uranium, total	< 0.000020	0.000020 mg/L							
Zinc, total	< 0.0040	0.0040 mg/L							
LCS (B8I0032-BS1)			Prepared: 2018-09-02, Analyzed: 2018-09-02						
Aluminum, total	0.0220	0.0050 mg/L	0.0200		110	80-120			
Antimony, total	0.0208	0.00020 mg/L	0.0200		104	80-120			
Arsenic, total	0.0209	0.00050 mg/L	0.0200		104	80-120			
Barium, total	0.0199	0.0050 mg/L	0.0200		100	80-120			
Boron, total	0.0204	0.0050 mg/L	0.0200		102	80-120			
Cadmium, total	0.0204	0.000010 mg/L	0.0200		102	80-120			
Calcium, total	1.99	0.20 mg/L	2.00		100	80-120			
Chromium, total	0.0200	0.00050 mg/L	0.0200		100	80-120			
Cobalt, total	0.0201	0.00010 mg/L	0.0200		101	80-120			

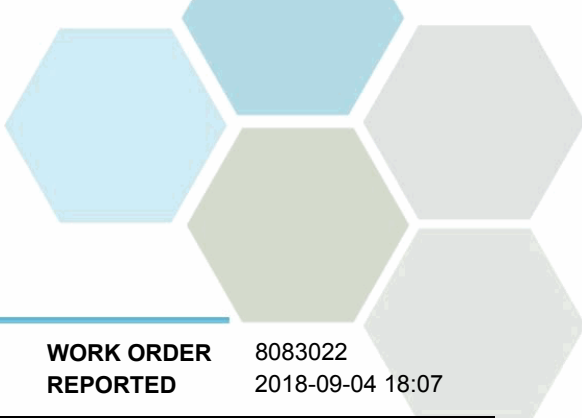


APPENDIX 2: QUALITY CONTROL RESULTS

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Analyte	Result	RL Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B8I0032, Continued									
LCS (B8I0032-BS1), Continued					Prepared: 2018-09-02, Analyzed: 2018-09-02				
Copper, total	0.0210	0.00040 mg/L	0.0200		105	80-120			
Iron, total	1.83	0.010 mg/L	2.00		92	80-120			
Lead, total	0.0202	0.00020 mg/L	0.0200		101	80-120			
Magnesium, total	2.08	0.010 mg/L	2.00		104	80-120			
Manganese, total	0.0202	0.00020 mg/L	0.0200		101	80-120			
Mercury, total	0.000861	0.000040 mg/L	0.00100		86	80-120			
Molybdenum, total	0.0194	0.00010 mg/L	0.0200		97	80-120			
Nickel, total	0.0203	0.00040 mg/L	0.0200		102	80-120			
Potassium, total	1.94	0.10 mg/L	2.00		97	80-120			
Selenium, total	0.0216	0.00050 mg/L	0.0200		108	80-120			
Sodium, total	2.08	0.10 mg/L	2.00		104	80-120			
Strontium, total	0.0202	0.0010 mg/L	0.0200		101	80-120			
Uranium, total	0.0194	0.000020 mg/L	0.0200		97	80-120			
Zinc, total	0.0223	0.0040 mg/L	0.0200		112	80-120			
Duplicate (B8I0032-DUP1)									
Source: 8083022-01			Prepared: 2018-09-02, Analyzed: 2018-09-02						
Aluminum, total	0.0073	0.0050 mg/L		< 0.0050					20
Antimony, total	< 0.00020	0.00020 mg/L		< 0.00020					20
Arsenic, total	< 0.00050	0.00050 mg/L		< 0.00050					15
Barium, total	0.0162	0.0050 mg/L		0.0160					9
Boron, total	0.0246	0.0050 mg/L		0.0217					20
Cadmium, total	0.000023	0.000010 mg/L		0.000019					20
Calcium, total	9.13	0.20 mg/L		8.99			2		12
Chromium, total	< 0.00050	0.00050 mg/L		< 0.00050					12
Cobalt, total	< 0.00010	0.00010 mg/L		< 0.00010					13
Copper, total	0.00357	0.00040 mg/L		0.00349			2		20
Iron, total	2.40	0.010 mg/L		2.39			< 1		18
Lead, total	0.00145	0.00020 mg/L		0.00141			3		20
Magnesium, total	1.16	0.010 mg/L		1.16			< 1		10
Manganese, total	0.0264	0.00020 mg/L		0.0263			< 1		13
Mercury, total	< 0.000040	0.000040 mg/L		< 0.000040					20 CT5
Molybdenum, total	0.00011	0.00010 mg/L		< 0.00010					20
Nickel, total	0.00137	0.00040 mg/L		0.00132					20
Potassium, total	0.62	0.10 mg/L		0.61			< 1		13
Selenium, total	< 0.00050	0.00050 mg/L		< 0.00050					20
Sodium, total	14.3	0.10 mg/L		14.3			< 1		10
Strontium, total	0.0807	0.0010 mg/L		0.0807			< 1		9
Uranium, total	< 0.000020	0.000020 mg/L		< 0.000020					14
Zinc, total	0.122	0.0040 mg/L		0.122			< 1		8
Reference (B8I0032-SRM1)									
					Prepared: 2018-09-02, Analyzed: 2018-09-02				
Aluminum, total	0.298	0.0050 mg/L	0.303		98	82-114			
Antimony, total	0.0523	0.00020 mg/L	0.0511		102	88-115			
Arsenic, total	0.125	0.00050 mg/L	0.118		106	88-111			
Barium, total	0.785	0.0050 mg/L	0.823		95	83-110			
Boron, total	3.30	0.0050 mg/L	3.45		96	80-118			
Cadmium, total	0.0500	0.000010 mg/L	0.0495		101	90-110			
Calcium, total	10.7	0.20 mg/L	11.6		92	85-113			
Chromium, total	0.254	0.00050 mg/L	0.250		102	88-111			
Cobalt, total	0.0392	0.00010 mg/L	0.0377		104	90-114			
Copper, total	0.514	0.00040 mg/L	0.486		106	90-117			
Iron, total	0.466	0.010 mg/L	0.488		96	90-116			
Lead, total	0.202	0.00020 mg/L	0.204		99	90-110			
Magnesium, total	3.89	0.010 mg/L	3.79		103	88-116			
Manganese, total	0.106	0.00020 mg/L	0.109		97	88-108			
Mercury, total	0.00503	0.000040 mg/L	0.00489		103	80-120			



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Total Metals, Batch B8I0032, Continued									
Reference (B8I0032-SRM1), Continued					Prepared: 2018-09-02, Analyzed: 2018-09-02				
Molybdenum, total	0.194	0.00010 mg/L	0.198		98	88-110			
Nickel, total	0.254	0.00040 mg/L	0.249		102	90-112			
Potassium, total	6.98	0.10 mg/L	7.21		97	87-116			
Selenium, total	0.132	0.00050 mg/L	0.121		109	90-122			
Sodium, total	7.69	0.10 mg/L	7.54		102	86-118			
Strontium, total	0.377	0.0010 mg/L	0.375		101	86-110			
Uranium, total	0.0291	0.000020 mg/L	0.0306		95	88-112			
Zinc, total	2.55	0.0040 mg/L	2.49		102	90-113			

QC Qualifiers:

CT5 This sample has been incorrectly preserved for Mercury analysis