

INUVIALUIT
SIVUNNIUQPAT
IMAKKUN



INUVIALUIT
WATER
BOARD

Hamlet of [REDACTED]
Water Licence Number: N7L3-1525

Municipal Water Licence

Annual Report for the Year 2018

Date Prepared: may 22, 2019

Municipal Water Licence Annual Report

Hamlet of Ulukhaktok
Licence # N7L3-1525
Reporting year 2018

1. Water Usage

Table 1: Monthly and annual quantities of fresh water obtained from all sources

Month	Volume from Source (m ³ or L)	Volume from any other Source (m ³ or L)
January	1,344,000	
February	1,270,000	
March	1,340,000	
April	1,439,000	
May	1,517,000	
June	1,940,000	
July	1,514,000	
August	1,502,000	
September	1,424,000	
October	1,612,000	
November	1,392,000	
December	1,267,000	
TOTALS	17,541,000	
ANNUAL TOTAL (m³ or L)		
% Increase or decrease from previous year		

Reasons for increase / decrease (if applicable):

3 New Duplexes and 1 4 plex was built in 2018.

Reasons for exceeding licensed withdrawal volumes (if applicable):

town is growing

General information:

2. Sewage Disposal

Table 2: Monthly and annual quantities of sewage discharged to the sewage disposal facilities

Month	Volume of sewage discharged (m ³ or L)
January	1196096 M
February	1003054 M
March	1124178 M
April	1092003 M
May	1025766 M
June	1129853 M
July	993591 M
August	1021980 M
September	1023871 M
October	1137423 M
November	1031447 M
December	1031443 M
ANNUAL TOTAL (m³ or L)	12810705 M
% Increase or decrease from previous year	

3. Hazardous Waste Storage and Transportation

On Table 3, list the types of hazardous waste accepted into the facility including volumes.

Table 3: Monthly and annual quantities of hazardous waste stored on site and transported off site

Month	Type of hazardous waste accepted (Volume in m ³ or L)	Type of hazardous waste transported off site (Volume in m ³ or L)
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		
ANNUAL TOTAL (m³ or L)		
% Increase or decrease from previous year	none	

If hazardous waste has been transported off site this year, please describe how it was transported and the final destination:

no

Please include treatment or disposal plans for the remaining quantities:

none

Please describe any changes or improvements to temporary hazardous waste storage areas:

none

4. Sewage Sludge Removal

Table 4: Monthly and annual quantities of sewage sludge removed from the sewage disposal facilities and disposal location

Month	Volume of sewage sludge removed (m ³ or L)	Disposal location
January		
February		
March		
April		
May		
June		
July		
August		
September		
October		
November		
December		
ANNUAL TOTAL (m³ or L)		
% Increase or decrease from previous year	none	

5. Problems, Modifications or Repairs Completed During the Year on Water Supply and Waste Disposal Facilities

Include any changes to infrastructure of all facilities completed during the year, including any changes, repairs and modifications. Please note any problems that occurred during the year. If there are no changes, make note of that also.

none

6. SNP Data

A condition of the Water Licence is the Surveillance Network Program (SNP). The SNP outlines the sampling requirements and frequency at monitoring stations. *In table 5, insert the sites sampled during the reporting year and the sampling period (sampling date). Attach the complete Taiga Laboratory results, with your "Municipal Water Licence Annual Report" to the Inuvialuit Water Board.*

Table 5: Sampling station and sampling period

Sampling station	After break-up	Prior to freeze-up
SNP # 1525-1		August 28, 2018
SNP # 1525-2		
SNP # 1525-3		
SNP # 1525-4	dried up (no sample taken)	
SNP # 1525-5		

7. Spills and Unauthorized Discharges

List any spills and unauthorized discharges, how and when they were reported, and clean up methods.

none

8. Spill Response Training and/or other Operator Training

Please provide a description of any Spill Response Training and/or other operator training carried out during the year.

none

9. Closure and Reclamation

Include a description of any closure, remediation and/or reclamation activities completed during the year and an outline of any work anticipated for next year.

none

10. Studies Requested by the Board that Relate to Water Use, Waste Disposal or Closure and Reclamation

If the Board has requested that specific studies be completed or have asked for specific information be included in the annual report, include these details in this section. Include a summary report of the study completed and the results. Include as attachments with the submission of the Annual Report. Include details of any upcoming studies that will be completed by the Hamlet.

none

11. Updates or Revisions to Approved Plans

Include details on any changes to approved plans such as the Solid and Sewage Waste Disposal Facilities Operating and Maintenance Plan (O&M Plan) or any other plans specific to your Water Licence.

- *Spill Contingency Plan*
- *Solid Waste Disposal Facilities Operation and Maintenance Plan*
- *Sewage Disposal Facilities Operation and Maintenance Plan*
- *Hazardous Waste Management Plan*
- *Closure and Reclamation Plan*

12. Inspection of Dams, Berms, Dykes and Control Structures

Include results of any inspections of all dams, berms, dykes and control structures related to the water intake facilities, solid waste disposal facilities, sewage disposal facilities and/or any other specific to your water licence.

all good

13. Inspections on all Water and Waste Disposal Facilities

Include results of regular staff inspections on all water and waste disposal facilities authorized under this licence and any corrective actions taken, as necessary.

good

14. Correspondence between the Inspector and the Licensee

Include all correspondence between the Inspector and the Licensee with your annual report.

15. Other Information

Include any other details on waste disposal requested by the Board by November 1, of the year being reported. In this section you may include non-compliance items identified in the inspection reports and how the Hamlet is addressing them. If there are any contaminated soil piles currently in use, please list the details of containment, remediation, and progress in this section. Ongoing issues with compliance can be identified here. If the IWB is aware of ongoing problems with the licence, discussions can occur to find a resolution.

okay

August 2018

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2156728-1 ULUKHAKTOK WTP-TREATED WATER STORAGE TANK VALVE							
Sampled By: CLIENT on 28-AUG-18 @ 15:35							
Matrix: GRAB							
Total Metals in Water by CRC ICPMS							
Phosphorus (P)-Total	<0.050		0.050	mg/L		05-SEP-18	R4203411
Potassium (K)-Total	1.11		0.050	mg/L		05-SEP-18	R4203411
Rubidium (Rb)-Total	0.00061		0.00020	mg/L		05-SEP-18	R4203411
Selenium (Se)-Total	<0.000050		0.000050	mg/L		05-SEP-18	R4203411
Silicon (Si)-Total	1.97		0.10	mg/L		05-SEP-18	R4203411
Silver (Ag)-Total	<0.000010		0.000010	mg/L		05-SEP-18	R4203411
Sodium (Na)-Total	12.3		0.050	mg/L		05-SEP-18	R4203411
Strontium (Sr)-Total	0.0254		0.00020	mg/L		05-SEP-18	R4203411
Sulfur (S)-Total	3.16		0.50	mg/L		05-SEP-18	R4203411
Tellurium (Te)-Total	<0.00020		0.00020	mg/L		05-SEP-18	R4203411
Thallium (Tl)-Total	<0.000010		0.000010	mg/L		05-SEP-18	R4203411
Thorium (Th)-Total	<0.00010		0.00010	mg/L		05-SEP-18	R4203411
Tin (Sn)-Total	<0.00010		0.00010	mg/L		05-SEP-18	R4203411
Titanium (Ti)-Total	<0.00030		0.00030	mg/L		05-SEP-18	R4203411
Tungsten (W)-Total	<0.00010		0.00010	mg/L		05-SEP-18	R4203411
Uranium (U)-Total	0.000113		0.000010	mg/L		05-SEP-18	R4203663
Vanadium (V)-Total	<0.00050		0.00050	mg/L		05-SEP-18	R4203411
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		05-SEP-18	R4203411
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		05-SEP-18	R4203411
VOC (THM) by Headspace GCMS							
Chloroform	0.0079		0.0010	mg/L	10-SEP-18	10-SEP-18	R4198892
Bromodichloromethane	0.0048		0.0010	mg/L	10-SEP-18	10-SEP-18	R4198892
Bromoform	<0.0010		0.0010	mg/L	10-SEP-18	10-SEP-18	R4198892
Dibromochloromethane	0.0022		0.0010	mg/L	10-SEP-18	10-SEP-18	R4198892

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
HTD	Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TITR-VA	Water	Alkalinity Species by Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
BR-L-IC-N-VA	Water	Bromide in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
CARBONS-DOC-VA	Water	Dissolved organic carbon by combustion	APHA 5310B
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310B TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CL-IC-N-VA	Water	Chloride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002
This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.			
COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	BCMOE Colour Single Wavelength
This analysis is carried out using procedures adapted from British Columbia Environmental Manual "Colour- Single Wavelength." Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method.			
Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.			
EC-SCREEN-VA	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
F-IC-N-VA	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-T-CVAA-VA	Water	Total Mercury in Water by CVAAS or CVAFS	EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.			
MET-T-CCMS-VA	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
NO2-L-IC-N-VA	Water	Nitrite in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-L-IC-N-VA	Water	Nitrate in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
		electrode	
		It is recommended that this analysis be conducted in the field.	
SO4-IC-N-VA	Water	Sulfate in Water by IC	EPA 300.1 (mod)
		Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.	
TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC
		This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.	
THM-HSMS-VA	Water	VOC (THM) by Headspace GCMS	EPA SW-846, METHOD 8260
		This procedure is suitable for the analysis of trihalomethanes (chloroform, bromodichloromethane, dibromochloromethane, and bromoform) in chlorinated waters that have been treated to prevent the formation of trihalomethanes after sample collection. The analysis involves the headspace extraction of the sample prior to analysis by capillary column gas chromatography with mass spectrometric detection (GC/MS). The trihalomethanes analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 8260, published by the United States Environmental Protection Agency (EPA).	
THM-SUM-CALC-VA	Water	Total Trihalomethane-THM	CALCULATION
		Total Trihalomethanes (where not conducted as part of a formation potential analysis) is equal to the sum of the individual parameter concentrations with non-detect results treated as zero.	
TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC
		This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.	
TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity
		This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.	

** 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
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

15-584139

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
 mg/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.



Environmental

Quality Control Report

Workorder: L2156728

Report Date: 26-OCT-18

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Client: Cash Clients
 Box 157
 ULUKHAKTOK NT X0E 0S0

Contact: SUSAN KAOLAK

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-VA		Water						
Batch	R4203604							
WG2867562-3	CRM	VA-ALK-TITR-CONTROL						
Alkalinity, Total (as CaCO3)			101.0		%		85-115	06-SEP-18
WG2867562-1	MB							
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	06-SEP-18
BR-L-IC-N-VA		Water						
Batch	R4201389							
WG2867572-2	LCS							
Bromide (Br)			101.4		%		85-115	04-SEP-18
WG2867572-1	MB							
Bromide (Br)			<0.050		mg/L		0.05	04-SEP-18
CARBONS-DOC-VA		Water						
Batch	R4210509							
WG2872244-4	LCS							
Dissolved Organic Carbon			105.0		%		80-120	10-SEP-18
WG2872244-3	MB							
Dissolved Organic Carbon			<0.50		mg/L		0.5	10-SEP-18
CARBONS-TOC-VA		Water						
Batch	R4208487							
WG2871404-2	DUP	L2156728-1						
Total Organic Carbon		4.07	3.61		mg/L	12	20	08-SEP-18
WG2871404-1	LCS							
Total Organic Carbon			99.7		%		80-120	08-SEP-18
WG2871404-5	LCS							
Total Organic Carbon			103.0		%		80-120	08-SEP-18
WG2871404-9	LCS							
Total Organic Carbon			101.7		%		80-120	08-SEP-18
WG2871404-4	MB							
Total Organic Carbon			<0.50		mg/L		0.5	08-SEP-18
WG2871404-8	MB							
Total Organic Carbon			<0.50		mg/L		0.5	08-SEP-18
CL-IC-N-VA		Water						
Batch	R4201389							
WG2867572-2	LCS							
Chloride (Cl)			99.4		%		90-110	04-SEP-18
WG2867572-1	MB							
Chloride (Cl)			<0.50		mg/L		0.5	04-SEP-18
CN-T-CFA-VA		Water						

Quality Control Report

Workorder: L2156728

Report Date: 26-OCT-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-T-CFA-VA		Water						
Batch	R4201150							
WG2867114-17	LCS							
Cyanide, Total			93.6		%		80-120	04-SEP-18
WG2867114-16	MB							
Cyanide, Total			<0.0050		mg/L		0.005	04-SEP-18
COLOUR-TRUE-VA		Water						
Batch	R4197387							
WG2866434-2	CRM	VA-COLOUR-T						
Colour, True			104.6		%		85-115	02-SEP-18
WG2866434-5	CRM	VA-COLOUR-T						
Colour, True			103.7		%		85-115	02-SEP-18
WG2866434-1	MB							
Colour, True			<5.0		CU		5	02-SEP-18
WG2866434-4	MB							
Colour, True			<5.0		CU		5	02-SEP-18
F-IC-N-VA		Water						
Batch	R4201389							
WG2867572-2	LCS							
Fluoride (F)			101.8		%		90-110	04-SEP-18
WG2867572-1	MB							
Fluoride (F)			<0.020		mg/L		0.02	04-SEP-18
HG-T-CVAA-VA		Water						
Batch	R4203542							
WG2869027-2	LCS							
Mercury (Hg)-Total			100.6		%		80-120	06-SEP-18
WG2869027-1	MB							
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	06-SEP-18
MET-T-CCMS-VA		Water						
Batch	R4203411							
WG2866942-2	LCS							
Aluminum (Al)-Total			94.1		%		80-120	05-SEP-18
Antimony (Sb)-Total			97.2		%		80-120	05-SEP-18
Arsenic (As)-Total			85.5		%		80-120	05-SEP-18
Barium (Ba)-Total			90.6		%		80-120	05-SEP-18
Beryllium (Be)-Total			93.2		%		80-120	05-SEP-18
Bismuth (Bi)-Total			92.1		%		80-120	05-SEP-18
Boron (B)-Total			93.3		%		80-120	05-SEP-18
Cadmium (Cd)-Total			86.6		%		80-120	05-SEP-18



Quality Control Report

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-VA	Water							
Batch	R4203411							
WG2866942-2	LCS							
Calcium (Ca)-Total			93.5		%		80-120	05-SEP-18
Cesium (Cs)-Total			89.1		%		80-120	05-SEP-18
Chromium (Cr)-Total			87.7		%		80-120	05-SEP-18
Cobalt (Co)-Total			86.7		%		80-120	05-SEP-18
Copper (Cu)-Total			85.3		%		80-120	05-SEP-18
Iron (Fe)-Total			90.3		%		80-120	05-SEP-18
Lead (Pb)-Total			97.1		%		80-120	05-SEP-18
Lithium (Li)-Total			95.0		%		80-120	05-SEP-18
Magnesium (Mg)-Total			89.2		%		80-120	05-SEP-18
Manganese (Mn)-Total			89.7		%		80-120	05-SEP-18
Molybdenum (Mo)-Total			92.3		%		80-120	05-SEP-18
Nickel (Ni)-Total			87.9		%		80-120	05-SEP-18
Phosphorus (P)-Total			88.1		%		80-120	05-SEP-18
Potassium (K)-Total			88.0		%		80-120	05-SEP-18
Rubidium (Rb)-Total			86.1		%		80-120	05-SEP-18
Selenium (Se)-Total			91.9		%		80-120	05-SEP-18
Silicon (Si)-Total			94.8		%		80-120	05-SEP-18
Silver (Ag)-Total			87.9		%		80-120	05-SEP-18
Sodium (Na)-Total			91.5		%		80-120	05-SEP-18
Strontium (Sr)-Total			89.4		%		80-120	05-SEP-18
Sulfur (S)-Total			81.7		%		80-120	05-SEP-18
Tellurium (Te)-Total			86.4		%		80-120	05-SEP-18
Thallium (Tl)-Total			91.1		%		80-120	05-SEP-18
Thorium (Th)-Total			87.3		%		80-120	05-SEP-18
Tin (Sn)-Total			89.3		%		80-120	05-SEP-18
Titanium (Ti)-Total			93.2		%		80-120	05-SEP-18
Tungsten (W)-Total			94.2		%		80-120	05-SEP-18
Uranium (U)-Total			85.9		%		80-120	05-SEP-18
Vanadium (V)-Total			91.0		%		80-120	05-SEP-18
Zinc (Zn)-Total			83.3		%		80-120	05-SEP-18
Zirconium (Zr)-Total			87.6		%		80-120	05-SEP-18
WG2866942-1	MB							
Aluminum (Al)-Total			<0.0030		mg/L		0.003	05-SEP-18
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	05-SEP-18



Quality Control Report

Workorder: L2156728

Report Date: 26-OCT-18

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-VA		Water						
Batch	R4203411							
WG2866942-1	MB							
Arsenic (As)-Total			<0.00010		mg/L		0.0001	05-SEP-18
Barium (Ba)-Total			<0.00010		mg/L		0.0001	05-SEP-18
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	05-SEP-18
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	05-SEP-18
Boron (B)-Total			<0.010		mg/L		0.01	05-SEP-18
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	05-SEP-18
Calcium (Ca)-Total			<0.050		mg/L		0.05	05-SEP-18
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	05-SEP-18
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	05-SEP-18
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	05-SEP-18
Copper (Cu)-Total			<0.00050		mg/L		0.0005	05-SEP-18
Iron (Fe)-Total			<0.010		mg/L		0.01	05-SEP-18
Lead (Pb)-Total			<0.000050		mg/L		0.00005	05-SEP-18
Lithium (Li)-Total			<0.0010		mg/L		0.001	05-SEP-18
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	05-SEP-18
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	05-SEP-18
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	05-SEP-18
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	05-SEP-18
Phosphorus (P)-Total			<0.050		mg/L		0.05	05-SEP-18
Potassium (K)-Total			<0.050		mg/L		0.05	05-SEP-18
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	05-SEP-18
Selenium (Se)-Total			<0.000050		mg/L		0.00005	05-SEP-18
Silicon (Si)-Total			<0.10		mg/L		0.1	05-SEP-18
Silver (Ag)-Total			<0.000010		mg/L		0.00001	05-SEP-18
Sodium (Na)-Total			<0.050		mg/L		0.05	05-SEP-18
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	05-SEP-18
Sulfur (S)-Total			<0.50		mg/L		0.5	05-SEP-18
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	05-SEP-18
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	05-SEP-18
Thorium (Th)-Total			<0.00010		mg/L		0.0001	05-SEP-18
Tin (Sn)-Total			<0.00010		mg/L		0.0001	05-SEP-18
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	05-SEP-18
Tungsten (W)-Total			<0.00010		mg/L		0.0001	05-SEP-18
Uranium (U)-Total			<0.000010		mg/L		0.00001	05-SEP-18



Quality Control Report

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-VA	Water							
Batch	R4203411							
WG2866942-1 MB								
Vanadium (V)-Total			<0.00050		mg/L		0.0005	05-SEP-18
Zinc (Zn)-Total			<0.0030		mg/L		0.003	05-SEP-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	05-SEP-18
NO2-L-IC-N-VA	Water							
Batch	R4201389							
WG2867572-2 LCS								
Nitrite (as N)			99.8		%		90-110	04-SEP-18
WG2867572-1 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	04-SEP-18
NO3-L-IC-N-VA	Water							
Batch	R4201389							
WG2867572-2 LCS								
Nitrate (as N)			99.8		%		90-110	04-SEP-18
WG2867572-1 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	04-SEP-18
PH-PCT-VA	Water							
Batch	R4203604							
WG2867562-2 CRM		VA-PH7-BUF						
pH			7.00		pH		6.9-7.1	06-SEP-18
SO4-IC-N-VA	Water							
Batch	R4201389							
WG2867572-2 LCS								
Sulfate (SO4)			100.7		%		90-110	04-SEP-18
WG2867572-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	04-SEP-18
TDS-VA	Water							
Batch	R4202288							
WG2867709-2 LCS								
Total Dissolved Solids			99.2		%		85-115	04-SEP-18
WG2867709-1 MB								
Total Dissolved Solids			<10		mg/L		10	04-SEP-18
THM-HSMS-VA	Water							



Quality Control Report

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
THM-HSMS-VA								
Batch R4198892								
WG2872127-2 LCS								
Chloroform			86.7		%		70-130	10-SEP-18
Bromodichloromethane			97.1		%		60-140	10-SEP-18
Bromoform			98.4		%		60-140	10-SEP-18
Dibromochloromethane			98.3		%		60-140	10-SEP-18
WG2872127-1 MB								
Chloroform			<0.0010		mg/L		0.001	10-SEP-18
Bromodichloromethane			<0.0010		mg/L		0.001	10-SEP-18
Bromoform			<0.0010		mg/L		0.001	10-SEP-18
Dibromochloromethane			<0.0010		mg/L		0.001	10-SEP-18
TSS-VA								
Batch R4201907								
WG2867235-5 LCS								
Total Suspended Solids			107.7		%		85-115	04-SEP-18
WG2867235-4 MB								
Total Suspended Solids			<3.0		mg/L		3	04-SEP-18
TURBIDITY-VA								
Batch R4196466								
WG2866500-2 CRM		VA-FORM-40						
Turbidity			101.5		%		85-115	02-SEP-18
WG2866500-5 CRM		VA-FORM-40						
Turbidity			100.8		%		85-115	02-SEP-18
WG2866500-1 MB								
Turbidity			<0.10		NTU		0.1	02-SEP-18
WG2866500-4 MB								
Turbidity			<0.10		NTU		0.1	02-SEP-18

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Quality Control Report

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Colour (True) by Spectrometer	1	28-AUG-18 15:35	02-SEP-18 14:42	3	5	days	EHTL
Turbidity by Meter	1	28-AUG-18 15:35	02-SEP-18 11:00	3	5	days	EHTL
pH by Meter (Automated)	1	28-AUG-18 15:35	06-SEP-18 08:01	0.25	208	hours	EHTR-FM
Anions and Nutrients							
Nitrate in Water by IC (Low Level)	1	28-AUG-18 15:35	04-SEP-18 07:16	3	7	days	EHTL
Nitrite in Water by IC (Low Level)	1	28-AUG-18 15:35	04-SEP-18 07:16	3	7	days	EHTL

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2156728 were received on 31-AUG-18 09:15.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



ENVIROMENTAL
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Chain of Custody (COC) / Analytical
Request Form
Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 15 - 584139
Page of

Report To Company: GNWT District of Health Services Contact: Maria Hard Phone: 867-929-4410 Street: 16 Vertigo Way City/Province: Whitecourt, AB Postal Code: T7S 1A5		Report Format / Distribution Select Report Format: <input checked="" type="checkbox"/> PDF <input type="checkbox"/> EXCEL <input type="checkbox"/> EOD (DIGITAL) Usually Central (QC) Report with Report: <input type="checkbox"/> YES <input type="checkbox"/> NO Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	
Invoice To: Same as Report To <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Copy of Invoice with Report: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Company: Whitecourt Health Services Contact: Susan Lockhart Project Information: Oil and Gas Required Fields (client use)		Select Invoicing Distribution: <input type="checkbox"/> EMAIL <input checked="" type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: PRR@MAIL.EDUCATION.AB.CA Email 2: PRR@MAIL.EDUCATION.AB.CA Email 3: PRR@MAIL.EDUCATION.AB.CA	
ALS Account # / Quote #: QES155 Job #: 12156728 PO / AFE: LSD: ALS Lab Work Order # (lab use only): 12156728		Select Invoicing Distribution: <input type="checkbox"/> EMAIL <input checked="" type="checkbox"/> MAIL <input type="checkbox"/> FAX Let Call Center: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Has Prod Code: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Requisitioner: Location: ALS Contact:	
ALS Sample # (lab use only): Sample Identification and/or Coordinates (This description will appear on the report): Whitecourt WTP - Treated water storage tanks		Date (dd/mm/yy): Aug 28/11 Time (hh:mm): 3:35pm Sample Type: Grab	
Drinking Water (DW) Samples (client use) Are samples taken from a Regulated DW System? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Are samples for human drinking water use? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only): Guidelines for Generation Drinking Water Quality	
Released by: _____ Date: _____ SHIPMENT RELEASE (client use)		Received by: _____ Date: 31/8/11 INITIAL SHIPMENT RECEPTION (lab use only)	
REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION 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 stated on the back page of the form - report copy 1. If any other samples are taken from a Regulated Drinking Water (DW) System please submit using an Authorized DW COC form		WHITE - LABORATORY COPY YELLOW - CLIENT COPY Barcode: L2156728-COFC	
SAMPLE CONDITION AS RECEIVED (lab use only) Frozen: <input type="checkbox"/> S.F. Observations: Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs: <input type="checkbox"/> Ice Cubes: <input type="checkbox"/> Custody seal intact: Yes <input type="checkbox"/> No <input type="checkbox"/> Cooking Included: <input type="checkbox"/>		Date and Time Required for ALL ESR TESTS: Regular (R) <input checked="" type="checkbox"/> Standard (ST) / received by 3 pm - business days, no holidays apply 4 day (P4) <input type="checkbox"/> 3 day (P3) <input type="checkbox"/> 2 day (P2) <input type="checkbox"/> 1 Business day (E1) <input type="checkbox"/> Same Day, Weekend or Statutory holiday (E0) <input type="checkbox"/>	
FINAL SHIPMENT RECEPTION (lab use only) Released by: _____ Date: _____		Analysis Request: 29 individual parameters (plus THMS) as per DW (plus water supply system) - see enclosure for details.	
FINAL COOLER TEMPERATURES °C: _____ FINAL COOLER TEMPERATURES °C: _____		Number of Containers: _____	

GENERAL TERMS AND CONDITIONS:

These terms and conditions are incorporated in and form part of the Agreement between ALS Group's Environmental Division and the party named in the Offer (the "Client").

1. Definitions. Capitalized Terms not defined in these Terms and Conditions have the definitions set out in the other Agreement documents.
2. The Services. ALS will provide the Services to the Client as described in the Offer and in any chain of custody form provided with any sample.
3. Prices. ALS may review and change all prices, fees, surcharges or other charges set out in the Agreement if there are changes to ALS's cost beyond ALS's control, including changes in legislative requirements, Client variations of sample numbers and Client requests for changes to standard reporting requirements. Notwithstanding Condition 3, all quotations are reviewed and updated on a yearly basis or expire after one year.
4. Payment Terms. The Client shall pay ALS within 30 days of the invoice date OAC. ALS may, for reasonable business reasons, require the Client to arrange for payment in advance.
5. Quotation Numbers. The Client shall provide the quotation number to ALS (where applicable) to ensure correct pricing.
6. Taxes. Applicable taxes are not included in prices - surcharges and additional fees will be added at the time of invoicing.
7. Quality Control. ALS has an extensive QA/QC program. Clients' samples are analyzed using approved, referenced procedures followed by thorough data validation prior to reporting the analytical results.
8. Test Results are Not Guaranteed. Results are obtained from analytical measurements that are subject to inherent variability. Measurement results reflect characteristics of submitted test samples at time of analysis. The Client is responsible for informing itself on the limitation of test results and acknowledges that test results are not guaranteed.
9. Standard of Care. ALS will use reasonable care and diligence as required by the laws of the province or territory where the sample is tested.
10. Storage. Where possible, ALS will store samples for 30 days from the date a final report is issued to the Client, after which ALS may discard the samples.
11. Holds. If the Client requests a sample to be placed on hold, ALS will store the sample for 30 days from date of receipt, after which ALS will invoice the Client and discard the sample. Longer hold periods are available upon request.
12. Archives. If the Client requests a sample be archived, ALS will invoice in advance and store the sample for the period requested, after which ALS may discard the sample.
13. Handling Protocol. Legal sample handling protocol must be arranged before samples are collected. ALS charges a surcharge on the list price plus the hourly technologist or chemist rates for legal sample protocol. Additional charges will apply for samples that require storage by ALS.
14. Samples. The quality, condition, content and source of samples stored and tested are not known to ALS except as declared and described on the chain of custody form completed and submitted by the Client and accompanying the sample.
15. Risk of Loss. ALS will use reasonable care to protect samples during storage, however all samples are stored at the Client's risk and the Client is responsible for obtaining appropriate insurance, if desired. The Client acknowledges that during the performance of the Services samples may be altered, lost, damaged or destroyed and the Client releases ALS from any claim the Client may have for any loss or damage to the sample.
16. Environmental. The Client must comply with all applicable environment legislation, including labeling all hazardous samples to comply with WHMIS and TDG regulations, and must provide appropriate Safety Data Sheets (previously referred to as "MSDS") that include the nature of the hazard and a contact name and phone number to call for information. The Client will indemnify ALS for all loss or damages, including any fine or cost of complying with an order of any government authority, resulting from the Client's breach of this paragraph.
17. Hazardous Materials Disposal. ALS may return, at the Client's cost, hazardous material to the Client for disposal.
18. Hazardous Materials Surcharge. ALS may apply an additional surcharge for handling of hazardous samples or samples with Naturally Occurring Radioactive Materials (NORM), H2S, CN, etc.
19. Sample Containers. ALS may ship sample containers to the Client's location by the most cost effective means using ALS preferred courier suppliers, within the specified project timeline.
20. Additional Charges. ALS may charge the Client (a) its cost for emergency bottle shipments and shipments to and from a remote site, and (b) where pick up and delivery services are provided, subject in each instance to a minimum charge of \$25.00.
21. Re-Tests. ALS reserves the right to re-test any samples that remain in its possession. Re-tests requested by the Client may be charged.
22. Waiver. The Client is responsible for making any assessment regarding the suitability of the Services and the intended results for the Client's purposes and waives any claims against ALS it may have as a result of the interpretation of the results. The Client shall indemnify ALS for all claims made by any third party against ALS in respect of all losses however arising from the performance of the Services or the use of any report provided in the performance of the Services.
23. Limitation of Liability. In no event shall ALS be liable for any consequential, indirect, incidental, special, exemplary or punitive damages, whether foreseeable or unforeseeable, (including claims for loss of profits or revenue or losses caused by stoppage of other work or impairment of other assets) incurred by the Client arising out of breach or failure of express or implied warranty, breach of contract, breach of warranty, misrepresentation, negligence, strict liability in tort or otherwise. In any event, the liability of ALS to the Client shall be limited to the cost of testing the sample as requested in the chain of custody form under which the sample was originally deposited. For the purposes of this paragraph and paragraphs 8, 15, 16, 22 and 24, as the applicable, "ALS" includes without limitations its directors, officers, employees and affiliates and the "Client" includes without limitation any third party that may have a claim against ALS through the Client.
24. Notice of Liability. Notwithstanding paragraph 23, ALS shall not be liable to the Client unless the Client provides notice in writing to ALS of such loss or damage, together with full particulars thereof, within 30 days of the Client's receipt of the report of the analysis of the sample giving rise to such liability. The provisions of this paragraph allocate the risk under the Agreement between the Client and ALS, and the fees to be paid by the Client to ALS reflect this allocation of risks and the limitations of liability in this Agreement.
25. Entire Agreement. The Agreement is the entire agreement between the parties and supersedes and takes precedence over any terms and conditions contained in any documentation provided by the Client. ALS's execution of any subsequent documentation from the Client only acknowledges receipt and not acceptance of any terms or conditions therein. If there is a conflict between these terms and conditions and any other Agreement document, these terms and conditions prevail.
26. Term. Providing the first batch of samples to which this tender refers is submitted within three months of the starting date of this quotation, the following prices, terms and conditions will remain firm until the closing date. This offer and terms and conditions will automatically lapse if the offer has not been accepted and samples not delivered to ALS within the Closing Date.
27. Termination. (a) Either party may terminate this Agreement for any reason by giving the other party thirty (30) days written notice (Notice Period); (b) If the Agreement is terminated pursuant to clause (a), then the Client must pay ALS for all Services performed up to the expiry of the Notice Period.



Cash Clients
ATTN: SUSAN KAOLAK
Box 157
ULUKHAKTOK NT XOE OSO

Date Received: 31-AUG-18
Report Date: 26-OCT-18 13:38 (MT)
Version: FINAL

Client Phone: 867-396-8000

Certificate of Analysis

Lab Work Order #: L2156728
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: 15-584139
Legal Site Desc:

Rick Zoklewski
General Manager

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ADDRESS: 314 Old Airport Road, Unit 116, Yellowknife, NT X1A 3T3 Canada | Phone: +1 867 873 5593 |
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2156728-1 ULUKHAKTOK WTP-TREATED WATER STORAGE TANK VALVE							
Sampled By: CLIENT on 28-AUG-18 @ 15:35							
Matrix: GRAB							
Alkalinity Species by Titration							
Alkalinity Species by Titration							
Alkalinity, Bicarbonate (as CaCO ₃)	119		1.0	mg/L		06-SEP-18	R4203604
Alkalinity, Carbonate (as CaCO ₃)	3.2		1.0	mg/L		06-SEP-18	R4203604
Alkalinity, Hydroxide (as CaCO ₃)	<1.0		1.0	mg/L		06-SEP-18	R4203604
Alkalinity, Total (as CaCO ₃)	122		1.0	mg/L		06-SEP-18	R4203604
Anions by Ion Chromatography							
Bromide in Water by IC (Low Level)							
Bromide (Br)	<0.050		0.050	mg/L		04-SEP-18	R4201389
Chloride in Water by IC							
Chloride (Cl)	17.0		0.50	mg/L		04-SEP-18	R4201389
Fluoride in Water by IC							
Fluoride (F)	0.182		0.020	mg/L		04-SEP-18	R4201389
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		04-SEP-18	R4201389
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		04-SEP-18	R4201389
Sulfate in Water by IC							
Sulfate (SO ₄)	9.31		0.30	mg/L		04-SEP-18	R4201389
Miscellaneous Parameters							
Colour, True	<5.0		5.0	CU		02-SEP-18	R4197387
Dissolved Organic Carbon	3.17	HTD	0.50	mg/L		10-SEP-18	R4210509
Hardness (as CaCO ₃)	123	HTC	0.50	mg/L		06-SEP-18	
Cyanide, Total	<0.0050		0.0050	mg/L		04-SEP-18	R4201150
Total Dissolved Solids	170		20	mg/L		04-SEP-18	R4202288
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		06-SEP-18	R4203542
Total Suspended Solids	<3.0		3.0	mg/L		04-SEP-18	R4201907
Total THMs	0.0149		0.0020	mg/L		13-SEP-18	
Total Organic Carbon	4.07		0.50	mg/L		08-SEP-18	R4208487
Turbidity	0.30		0.10	NTU		02-SEP-18	R4196466
pH	8.33		0.10	pH		06-SEP-18	R4203604
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0069		0.0030	mg/L		05-SEP-18	R4203411
Antimony (Sb)-Total	<0.00010		0.00010	mg/L		05-SEP-18	R4203411
Arsenic (As)-Total	0.00024		0.00010	mg/L		05-SEP-18	R4203411
Barium (Ba)-Total	0.00723		0.00010	mg/L		05-SEP-18	R4203411
Beryllium (Be)-Total	<0.00010		0.00010	mg/L		05-SEP-18	R4203411
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L		05-SEP-18	R4203411
Boron (B)-Total	0.114		0.010	mg/L		05-SEP-18	R4203411
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		05-SEP-18	R4203411
Calcium (Ca)-Total	29.0		0.050	mg/L		05-SEP-18	R4203411
Cesium (Cs)-Total	<0.000010		0.000010	mg/L		05-SEP-18	R4203411
Chromium (Cr)-Total	0.00011		0.00010	mg/L		05-SEP-18	R4203411
Cobalt (Co)-Total	<0.00010		0.00010	mg/L		05-SEP-18	R4203411
Copper (Cu)-Total	0.00468		0.00050	mg/L		05-SEP-18	R4203411
Iron (Fe)-Total	<0.010		0.010	mg/L		05-SEP-18	R4203411
Lead (Pb)-Total	<0.000050		0.000050	mg/L		05-SEP-18	R4203411
Lithium (Li)-Total	0.0015		0.0010	mg/L		05-SEP-18	R4203411
Magnesium (Mg)-Total	12.2		0.0050	mg/L		05-SEP-18	R4203411
Manganese (Mn)-Total	0.00257		0.00010	mg/L		05-SEP-18	R4203411
Molybdenum (Mo)-Total	0.000187		0.000050	mg/L		05-SEP-18	R4203411
Nickel (Ni)-Total	<0.00050		0.00050	mg/L		05-SEP-18	R4203411

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