Bijaya Adhikari

From: John Holland <sao@paulatuk.ca>
Sent: October 15, 2018 9:15 AM
To: Bijaya Adhikari
Subject: Paulatuk Water sample results
Attachments: Paulatuk September 2018 Water sample results.pdf

Attached are results from a water sample taken in September by the Environmental Health Officer.

John Holland

Cash Clients
ATTN: John Holland
Hamlet of Paulatuk
PO BOX 96
Paulatuk NT X0E 1N0

Date Received: 10-SEP-18
Report Date: 03-OCT-18 13:36 (MT)
Version: FINAL

Client Phone: 867-580-3531

Certificate of Analysis

Lab Work Order #: L2161176

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: 15-584354
Legal Site Desc:

Rick Zolkiewski
General Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L2161176-1				
	Description	GRAB				
	Sampled Date	05-SEP-18				
	Sampled Time	14:30				
	Client ID	PAULATUK WTP (TREATED WATER) - HAMLET OFFICE TAP				
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0				
	Hardness (as CaCO3) (mg/L)	266 HTC				
	pH (pH)	8.37				
	Total Suspended Solids (mg/L)	<3.0				
	Total Dissolved Solids (mg/L)	370				
	Turbidity (NTU)	0.47				
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	144				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	6.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0				
	Alkalinity, Total (as CaCO3) (mg/L)	150				
	Bromide (Br) (mg/L)	<0.050				
	Chloride (Cl) (mg/L)	7.75				
	Fluoride (F) (mg/L)	0.041				
	Nitrate (as N) (mg/L)	0.0336				
	Nitrite (as N) (mg/L)	<0.0010				
	Sulfate (SO4) (mg/L)	123				
Cyanides	Cyanide, Total (mg/L)	<0.10				
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.66				
	Total Organic Carbon (mg/L)	2.85				
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0030				
	Antimony (Sb)-Total (mg/L)	<0.00010				
	Arsenic (As)-Total (mg/L)	0.00030				
	Barium (Ba)-Total (mg/L)	0.0479				
	Beryllium (Be)-Total (mg/L)	<0.00010				
	Bismuth (Bi)-Total (mg/L)	<0.000050				
	Boron (B)-Total (mg/L)	<0.010				
	Cadmium (Cd)-Total (mg/L)	<0.0000050				
	Calcium (Ca)-Total (mg/L)	54.6				
	Cesium (Cs)-Total (mg/L)	<0.000010				
	Chromium (Cr)-Total (mg/L)	<0.00010				
	Cobalt (Co)-Total (mg/L)	<0.00010				
	Copper (Cu)-Total (mg/L)	0.131				
	Iron (Fe)-Total (mg/L)	0.024				
	Lead (Pb)-Total (mg/L)	0.00104				
	Lithium (Li)-Total (mg/L)	0.0026				
	Magnesium (Mg)-Total (mg/L)	31.4				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L2161176-1				
	Description	GRAB				
	Sampled Date	05-SEP-18				
	Sampled Time	14:30				
	Client ID	PAULATUK WTP (TREATED WATER) - HAMLET OFFICE TAP				
Grouping	**Analyte**					
WATER						
Total Metals	Manganese (Mn)-Total (mg/L)	0.00650				
	Mercury (Hg)-Total (mg/L)	<0.0000050				
	Molybdenum (Mo)-Total (mg/L)	0.000071				
	Nickel (Ni)-Total (mg/L)	0.00125				
	Phosphorus (P)-Total (mg/L)	<0.050				
	Potassium (K)-Total (mg/L)	0.600				
	Rubidium (Rb)-Total (mg/L)	0.00023				
	Selenium (Se)-Total (mg/L)	<0.000050				
	Silicon (Si)-Total (mg/L)	1.08				
	Silver (Ag)-Total (mg/L)	<0.000010				
	Sodium (Na)-Total (mg/L)	4.67				
	Strontium (Sr)-Total (mg/L)	0.0652				
	Sulfur (S)-Total (mg/L)	41.8				
	Tellurium (Te)-Total (mg/L)	<0.00020				
	Thallium (Tl)-Total (mg/L)	<0.000010				
	Thorium (Th)-Total (mg/L)	<0.00010				
	Tin (Sn)-Total (mg/L)	<0.00010				
	Titanium (Ti)-Total (mg/L)	<0.00030				
	Tungsten (W)-Total (mg/L)	<0.00010				
	Uranium (U)-Total (mg/L)	0.000067				
	Vanadium (V)-Total (mg/L)	<0.00050				
	Zinc (Zn)-Total (mg/L)	0.0155				
	Zirconium (Zr)-Total (mg/L)	<0.000060				
Trihalomethanes	Bromodichloromethane (mg/L)	0.0023				
	Bromoform (mg/L)	<0.0010				
	Dibromochloromethane (mg/L)	<0.0010				
	Chloroform (mg/L)	0.0074				
	Total THMs (mg/L)	0.0097				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Dissolved Organic Carbon	MS-B	L2161176-1
Matrix Spike	Total Organic Carbon	MS-B	L2161176-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2161176-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2161176-1
Matrix Spike	Copper (Cu)-Total	MS-B	L2161176-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2161176-1
Matrix Spike	Potassium (K)-Total	MS-B	L2161176-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2161176-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2161176-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2161176-1

Qualifiers for Individual Parameters Listed:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
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)

Reference Information

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 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:

15-584354

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
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 of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
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.

Quality Control Report

Client: Cash Clients
Hamlet of Paulatuk PO BOX 96
Paulatuk NT X0E 1N0
Contact: John Holland

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-VA	**Water**							
Batch R4216611								
WG2875309-3 CRM		**VA-ALK-TITR-CONTROL**						
Alkalinity, Total (as CaCO3)			100.8		%		85-115	14-SEP-18
WG2875309-1 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	14-SEP-18
BR-L-IC-N-VA	**Water**							
Batch R4215509								
WG2875494-2 LCS								
Bromide (Br)			104.2		%		85-115	13-SEP-18
WG2875494-1 MB								
Bromide (Br)			<0.050		mg/L		0.05	13-SEP-18
CARBONS-DOC-VA	**Water**							
Batch R4217861								
WG2877890-4 LCS								
Dissolved Organic Carbon			102.0		%		80-120	16-SEP-18
WG2877890-8 LCS								
Dissolved Organic Carbon			94.1		%		80-120	16-SEP-18
WG2877890-3 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	16-SEP-18
WG2877890-7 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	16-SEP-18
CARBONS-TOC-VA	**Water**							
Batch R4217859								
WG2877887-1 LCS								
Total Organic Carbon			95.9		%		80-120	16-SEP-18
WG2877887-5 LCS								
Total Organic Carbon			96.9		%		80-120	16-SEP-18
WG2877887-9 LCS								
Total Organic Carbon			98.8		%		80-120	16-SEP-18
WG2877887-4 MB								
Total Organic Carbon			<0.50		mg/L		0.5	16-SEP-18
WG2877887-8 MB								
Total Organic Carbon			<0.50		mg/L		0.5	16-SEP-18
CL-IC-N-VA	**Water**							
Batch R4215509								
WG2875494-2 LCS								
Chloride (Cl)			103.5		%		90-110	13-SEP-18
WG2875494-1 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-IC-N-VA	**Water**							
Batch R4215509								
WG2875494-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	13-SEP-18
CN-T-CFA-VA	**Water**							
Batch R4233068								
WG2882603-7 LCS								
Cyanide, Total			85.2		%		80-120	20-SEP-18
WG2882603-6 MB								
Cyanide, Total			<0.0050		mg/L		0.005	20-SEP-18
COLOUR-TRUE-VA	**Water**							
Batch R4213357								
WG2874034-2 CRM		**VA-COLOUR-T**						
Colour, True			103.5		%		85-115	12-SEP-18
WG2874034-1 MB								
Colour, True			<5.0		CU		5	12-SEP-18
F-IC-N-VA	**Water**							
Batch R4215509								
WG2875494-2 LCS								
Fluoride (F)			109.5		%		90-110	13-SEP-18
WG2875494-1 MB								
Fluoride (F)			<0.020		mg/L		0.02	13-SEP-18
HG-T-CVAA-VA	**Water**							
Batch R4214884								
WG2875318-2 LCS								
Mercury (Hg)-Total			101.5		%		80-120	13-SEP-18
WG2875318-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	13-SEP-18
MET-T-CCMS-VA	**Water**							
Batch R4214735								
WG2874109-2 LCS								
Aluminum (Al)-Total			96.9		%		80-120	12-SEP-18
Antimony (Sb)-Total			103.2		%		80-120	12-SEP-18
Arsenic (As)-Total			99.8		%		80-120	12-SEP-18
Barium (Ba)-Total			96.4		%		80-120	12-SEP-18
Beryllium (Be)-Total			95.2		%		80-120	12-SEP-18
Bismuth (Bi)-Total			98.6		%		80-120	12-SEP-18
Boron (B)-Total			90.0		%		80-120	12-SEP-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-VA	**Water**							
Batch R4214735								
WG2874109-2 LCS								
Cadmium (Cd)-Total			96.0		%		80-120	12-SEP-18
Calcium (Ca)-Total			93.4		%		80-120	12-SEP-18
Cesium (Cs)-Total			96.6		%		80-120	12-SEP-18
Chromium (Cr)-Total			98.4		%		80-120	12-SEP-18
Cobalt (Co)-Total			97.4		%		80-120	12-SEP-18
Copper (Cu)-Total			95.1		%		80-120	12-SEP-18
Iron (Fe)-Total			94.1		%		80-120	12-SEP-18
Lead (Pb)-Total			96.5		%		80-120	12-SEP-18
Lithium (Li)-Total			94.3		%		80-120	12-SEP-18
Magnesium (Mg)-Total			94.4		%		80-120	12-SEP-18
Manganese (Mn)-Total			98.4		%		80-120	12-SEP-18
Molybdenum (Mo)-Total			101.3		%		80-120	12-SEP-18
Nickel (Ni)-Total			96.4		%		80-120	12-SEP-18
Phosphorus (P)-Total			105.8		%		80-120	12-SEP-18
Potassium (K)-Total			96.7		%		80-120	12-SEP-18
Rubidium (Rb)-Total			97.0		%		80-120	12-SEP-18
Selenium (Se)-Total			92.8		%		80-120	12-SEP-18
Silicon (Si)-Total			96.7		%		80-120	12-SEP-18
Silver (Ag)-Total			97.8		%		80-120	12-SEP-18
Sodium (Na)-Total			91.4		%		80-120	12-SEP-18
Strontium (Sr)-Total			99.6		%		80-120	12-SEP-18
Sulfur (S)-Total			93.6		%		80-120	12-SEP-18
Tellurium (Te)-Total			95.3		%		80-120	12-SEP-18
Thallium (Tl)-Total			95.9		%		80-120	12-SEP-18
Thorium (Th)-Total			88.0		%		80-120	12-SEP-18
Tin (Sn)-Total			99.1		%		80-120	12-SEP-18
Titanium (Ti)-Total			89.1		%		80-120	12-SEP-18
Tungsten (W)-Total			97.1		%		80-120	12-SEP-18
Uranium (U)-Total			93.0		%		80-120	12-SEP-18
Vanadium (V)-Total			98.9		%		80-120	12-SEP-18
Zinc (Zn)-Total			96.0		%		80-120	12-SEP-18
Zirconium (Zr)-Total			95.7		%		80-120	12-SEP-18
WG2874109-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	12-SEP-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-VA	**Water**							
Batch R4214735								
WG2874109-1 MB								
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	12-SEP-18
Arsenic (As)-Total			<0.00010		mg/L		0.0001	12-SEP-18
Barium (Ba)-Total			<0.00010		mg/L		0.0001	12-SEP-18
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	12-SEP-18
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	12-SEP-18
Boron (B)-Total			<0.010		mg/L		0.01	12-SEP-18
Cadmium (Cd)-Total			<0.000005C		mg/L		0.000005	12-SEP-18
Calcium (Ca)-Total			<0.050		mg/L		0.05	12-SEP-18
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	12-SEP-18
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	12-SEP-18
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	12-SEP-18
Copper (Cu)-Total			<0.00050		mg/L		0.0005	12-SEP-18
Iron (Fe)-Total			<0.010		mg/L		0.01	12-SEP-18
Lead (Pb)-Total			<0.000050		mg/L		0.00005	12-SEP-18
Lithium (Li)-Total			<0.0010		mg/L		0.001	12-SEP-18
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	12-SEP-18
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	12-SEP-18
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	12-SEP-18
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	12-SEP-18
Phosphorus (P)-Total			<0.050		mg/L		0.05	12-SEP-18
Potassium (K)-Total			<0.050		mg/L		0.05	12-SEP-18
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	12-SEP-18
Selenium (Se)-Total			<0.000050		mg/L		0.00005	12-SEP-18
Silicon (Si)-Total			<0.10		mg/L		0.1	12-SEP-18
Silver (Ag)-Total			<0.000010		mg/L		0.00001	12-SEP-18
Sodium (Na)-Total			<0.050		mg/L		0.05	12-SEP-18
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	12-SEP-18
Sulfur (S)-Total			<0.50		mg/L		0.5	12-SEP-18
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	12-SEP-18
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	12-SEP-18
Thorium (Th)-Total			<0.00010		mg/L		0.0001	12-SEP-18
Tin (Sn)-Total			<0.00010		mg/L		0.0001	12-SEP-18
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	12-SEP-18
Tungsten (W)-Total			<0.00010		mg/L		0.0001	12-SEP-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-VA	**Water**							
Batch R4214735								
WG2874109-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	12-SEP-18
Vanadium (V)-Total			<0.00050		mg/L		0.0005	12-SEP-18
Zinc (Zn)-Total			<0.0030		mg/L		0.003	12-SEP-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	12-SEP-18
NO2-L-IC-N-VA	**Water**							
Batch R4215509								
WG2875494-2 LCS								
Nitrite (as N)			101.2		%		90-110	13-SEP-18
WG2875494-1 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	13-SEP-18
NO3-L-IC-N-VA	**Water**							
Batch R4215509								
WG2875494-2 LCS								
Nitrate (as N)			103.0		%		90-110	13-SEP-18
WG2875494-1 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	13-SEP-18
PH-PCT-VA	**Water**							
Batch R4216611								
WG2875309-2 CRM		**VA-PH7-BUF**						
pH			7.01		pH		6.9-7.1	14-SEP-18
SO4-IC-N-VA	**Water**							
Batch R4215509								
WG2875494-2 LCS								
Sulfate (SO4)			104.1		%		90-110	13-SEP-18
WG2875494-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	13-SEP-18
TDS-VA	**Water**							
Batch R4215514								
WG2875182-2 LCS								
Total Dissolved Solids			101.1		%		85-115	12-SEP-18
WG2875182-1 MB								
Total Dissolved Solids			<10		mg/L		10	12-SEP-18
THM-HSMS-VA	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
THM-HSMS-VA	**Water**							
Batch R4209387								
WG2879012-3 DUP		**L2161176-1**						
Chloroform		0.0074	0.0076		mg/L	2.7	30	17-SEP-18
Bromodichloromethane		0.0023	0.0024		mg/L	1.5	30	17-SEP-18
Bromoform		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	17-SEP-18
Dibromochloromethane		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	17-SEP-18
WG2879012-2 LCS								
Chloroform			95.9		%		70-130	17-SEP-18
Bromodichloromethane			96.7		%		60-140	17-SEP-18
Bromoform			96.0		%		60-140	17-SEP-18
Dibromochloromethane			87.5		%		60-140	17-SEP-18
WG2879012-1 MB								
Chloroform			<0.0010		mg/L		0.001	17-SEP-18
Bromodichloromethane			<0.0010		mg/L		0.001	17-SEP-18
Bromoform			<0.0010		mg/L		0.001	17-SEP-18
Dibromochloromethane			<0.0010		mg/L		0.001	17-SEP-18
TSS-VA	**Water**							
Batch R4215666								
WG2874628-8 LCS								
Total Suspended Solids			95.3		%		85-115	12-SEP-18
WG2874628-7 MB								
Total Suspended Solids			<3.0		mg/L		3	12-SEP-18
TURBIDITY-VA	**Water**							
Batch R4216333								
WG2876830-2 CRM		**VA-FORM-40**						
Turbidity			103.3		%		85-115	14-SEP-18
WG2876830-1 MB								
Turbidity			<0.10		NTU		0.1	14-SEP-18

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

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	05-SEP-18 14:30	12-SEP-18 03:23	3	7	days	EHTR
Turbidity by Meter							
	1	05-SEP-18 14:30	14-SEP-18 10:00	3	9	days	EHTR
pH by Meter (Automated)							
	1	05-SEP-18 14:30	14-SEP-18 11:11	0.25	213	hours	EHTR-FM
Anions and Nutrients							
Nitrate in Water by IC (Low Level)							
	1	05-SEP-18 14:30	13-SEP-18 06:21	3	8	days	EHTR
Nitrite in Water by IC (Low Level)							
	1	05-SEP-18 14:30	13-SEP-18 06:21	3	8	days	EHTR
Cyanides							
Total Cyanide in water by CFA							
	1	05-SEP-18 14:30	20-SEP-18 17:24	14	15	days	EHT

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 L2161176 were received on 10-SEP-18 11:00.

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.

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.

ALS Environmental
www.alsglobal.com

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 - 584354

Page of

Report To	Contact and company name below will appear on the final report	Report Format / Distribution	Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply
Company:	GNWT Depart. of Health & Social Services	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Shawn Hardy	Quality Control (QC) Report with Report ☑ YES ☐ NO	PRIORITY (Business Days): 4 day [P4] ☐ / 3 day [P3] ☐ / 2 day [P2] ☐ — EMERGENCY: 1 Business day [E1] ☐ / Same Day, Weekend or Statutory holiday [E0] ☐
Phone:	867-777-4840	☑ Compare Results to Criteria on Report - provide details below if box checked	Date and Time Required for all E&P TATs:
	Company address below will appear on the final report	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	For tests that can not be performed according to the service level selected, you will be contacted.
Street:	106 Veterans Way, P.O. Box 1480	Email 1 or Fax	
City/Province:	Inuvik, NT	Email 2 Environmental_Health@gov.nt.ca	
Postal Code:	X0E 0T0	Email 3	

Invoice To		Invoice Distribution	Analysis Request
	Same as Report To ☐ YES ☑ NO	Select Invoice Distribution: ☐ EMAIL ☑ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☐ YES ☑ NO	Email 1 or Fax Please mail invoice to	28 chemical/physical parameters (plus THMs) as per NWT water Supply System Regulation. Please see original email for details.
Company:	Hamlet of Paulatuk	Email 2 Hamlet address on the left	
Contact:	P.O. Box 98, Paulatuk, NT X0E 1N0		

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #	SAO: John Holland	AFE/Cost Center:	PO#
Job #:	Phone: 867-580-3531	Major/Minor Code:	Routing Code:
PO / AFE:	Email: sao@paulatuk.ca	Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (lab use only)	ALS Contact:	Sampler:

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Number of Containers
S.H.	Paulatuk ~~Hamlet office~~ WTP (treated water) - Hamlet office tap	Sept 5/18	2:30pm	Grab	
	* Note: Preservatives were missing for this kit (for all except THM vials), and noted that bottles were not pre-charged either. (S.H.)				

L2161176-COFC

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☑ YES ☐ NO	Guidelines for Canadian Drinking Water Quality
Are samples for human drinking water use? ☑ YES ☐ NO	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐		SIF Observations	Yes ☐	No ☐	
Ice Packs ☐	Ice Cubes ☐	Custody seal intact	Yes ☐	No ☐	
Cooling Initiated ☐					

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
2.7 C					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: Mikhail	Date: Sept 10/18	Time: 11:00 AM	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

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.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.