2020 SECOND QUARTER REPORT
FOR GN-CGS RANKIN INLET

QUARTER BEING REPORTED: April - June 2020

The following information is compiled pursuant to the requirements of Part B, Item 2 of Water Licence No. **3AM-GRA1624** issued to **Government of Nunavut, Department of Community and Government Services (GN-CGS)**.

a) Tabular summaries of all data generated under the Monitoring Program; and
b) Monthly quantities of fresh water obtained from all sources;

Below are results for Monitoring Program Stations GRA-1 and GRA-3.

Month Reported	Quantity of Water Obtained from all Sources (m^3)	Quantity of Sewage Waste Discharged (Estimated, m^3)
April	0.00	Same
May	0.00	Same
June	53,982.00	Same
QUARTER TOTAL	**53,982.00**	**53,982.00**

*Missing log sheets have made monthly totals inconsistent and inaccurate.

As per Part H, Item 5 of the Licence, below is a summary of solids removed from the Sewage Treatment Facility at Monitoring Station Number GRA-4.

Month Reported	Solids Removed from the Sewage Treatment Facility (m^3)
January	4
February	4
March	4
QUARTER TOTAL	**12**

c) Quarterly sampling results from Monitoring Program Station GRA-3;

Refer to attached 2019 sampling results for GRA-3 (Appendix A).

Below are the results for Monitoring Program Station GRA-7. There was a total water volume 0.00 m^3 transferred from Lower Landing Lake to Nipissar Lake in the recorded quarter.

Month Reported	Water Transferred From Lower Landing Lake to Nipissar (m^3)
April	None
May	None
June	No Volume on Record
QUARTER TOTAL	

d) The current estimated volume of Nipissar Lake based on water elevation determined at Monitoring Program Station GRA-5.

As per Part H, Item 6 of the Licence, the Licensee shall record water elevation monthly, during periods of open water at Monitoring Program Station GRA-5.

An elevation reading could not be taken as there was **no open water** during April and May of the quarter being reported.

Month Reported	Nipissar Lake Water Elevation (in)
April	No Open Water
May	No Open Water
June	No Reading on Record

List of Appendices

Appendix A: Certificate of Analysis, April 20, 2020 – 20 pages
Certificate of Analysis, May 13, 2020 – 18 pages
Certificate of Analysis, June 3, 2020 – 19 pages
Appendix B: Daily Record of Nipissar Lake Volumes GRA-1 – 1 page

Appendix A: Certificate of Analysis, April 20, 2020
Certificate of Analysis, May 13, 2020
Certificate of Analysis, June 3, 2020

Nunavut Community & Government Services - Rankin Inlet
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Date Received: 22-APR-20
Report Date: 29-APR-20 13:04 (MT)
Version: FINAL

Client Phone: 867-645-8155

Certificate of Analysis

Lab Work Order #: L2439226

Project P.O. #: NOT SUBMITTED
Job Reference: RANKIN INLET WWTP - MONTHLY EFFLUENT
C of C Numbers:
Legal Site Desc:

Craig Riddell, B.Sc.Ag
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2439226-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 20-APR-20 @ 10:00							
Matrix: WASTE							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050	VOCHS	0.00050	mg/L		23-APR-20	R5066839
Toluene	0.0010	VOCHS	0.0010	mg/L		23-APR-20	R5066839
Ethyl benzene	<0.00050	VOCHS	0.00050	mg/L		23-APR-20	R5066839
o-Xylene	0.00095	VOCHS	0.00050	mg/L		23-APR-20	R5066839
m+p-Xylenes	0.00141	VOCHS	0.00040	mg/L		23-APR-20	R5066839
F1 (C6-C10)	<0.10	VOCHS	0.10	mg/L		23-APR-20	R5066839
Surrogate: 4-Bromofluorobenzene (SS)	108.1		70-130	%		23-APR-20	R5066839
CCME PHC F2-F4 in Water							
F2 (C10-C16)	1.04		0.10	mg/L	24-APR-20	24-APR-20	R5064119
F3 (C16-C34)	7.65		0.25	mg/L	24-APR-20	24-APR-20	R5064119
F4 (C34-C50)	2.93		0.25	mg/L	24-APR-20	24-APR-20	R5064119
Surrogate: 2-Bromobenzotrifluoride	101.0		60-140	%	24-APR-20	24-APR-20	R5064119
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		28-APR-20	
F2-Naphth	1.04		0.10	mg/L		28-APR-20	
F3-PAH	7.65		0.25	mg/L		28-APR-20	
Total Hydrocarbons (C6-C50)	11.6		0.38	mg/L		28-APR-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	0.00237		0.00064	mg/L		28-APR-20	
Miscellaneous Parameters							
Fluoride (F)	0.160		0.020	mg/L		22-APR-20	R5061690
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	>24200	PEHR	10	MPN/100mL		22-APR-20	R5061477
Escherichia Coli	>24200	PEHR	10	MPN/100mL		22-APR-20	R5061477
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	0.000182		0.000020	mg/L	24-APR-20	27-APR-20	R5066061
2-Methyl Naphthalene	0.000276		0.000020	mg/L	24-APR-20	27-APR-20	R5066061
Acenaphthene	<0.000020		0.000020	mg/L	24-APR-20	27-APR-20	R5066061
Acenaphthylene	<0.000020		0.000020	mg/L	24-APR-20	27-APR-20	R5066061
Anthracene	<0.000010		0.000010	mg/L	24-APR-20	27-APR-20	R5066061
Acridine	<0.000020		0.000020	mg/L	24-APR-20	27-APR-20	R5066061
Benzo(a)anthracene	<0.000010		0.000010	mg/L	24-APR-20	27-APR-20	R5066061
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	24-APR-20	27-APR-20	R5066061
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	24-APR-20	27-APR-20	R5066061
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	24-APR-20	27-APR-20	R5066061
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	24-APR-20	27-APR-20	R5066061
Chrysene	<0.000020		0.000020	mg/L	24-APR-20	27-APR-20	R5066061
Dibenzo(a,h)anthracene	<0.000010	DLCI	0.000010	mg/L	24-APR-20	27-APR-20	R5066061
Fluoranthene	<0.000020		0.000020	mg/L	24-APR-20	27-APR-20	R5066061
Fluorene	0.000021	EMPC	0.000020	mg/L	24-APR-20	27-APR-20	R5066061
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	24-APR-20	27-APR-20	R5066061
Naphthalene	0.000215	EMPC	0.000050	mg/L	24-APR-20	27-APR-20	R5066061
Phenanthrene	<0.000050		0.000050	mg/L	24-APR-20	27-APR-20	R5066061
Pyrene	<0.000010		0.000010	mg/L	24-APR-20	27-APR-20	R5066061
Quinoline	<0.000020		0.000020	mg/L	24-APR-20	27-APR-20	R5066061
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	24-APR-20	27-APR-20	R5066061
Surrogate: Acenaphthene d10	108.7		60-130	%	24-APR-20	27-APR-20	R5066061
Surrogate: Acridine d9	97.0		60-130	%	24-APR-20	27-APR-20	R5066061
Surrogate: Chrysene d12	91.7		60-130	%	24-APR-20	27-APR-20	R5066061
Surrogate: Naphthalene d8	105.1		50-130	%	24-APR-20	27-APR-20	R5066061
Surrogate: Phenanthrene d10	107.9		60-130	%	24-APR-20	27-APR-20	R5066061

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2439226-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 20-APR-20 @ 10:00							
Matrix: WASTE							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	154		1.2	mg/L		25-APR-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		25-APR-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-APR-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	127		1.0	mg/L		24-APR-20	R5064357
Ammonia by colour							
Ammonia, Total (as N)	6.21		0.20	mg/L		25-APR-20	R5064276
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	95		20	mg/L		23-APR-20	R5067521
Carbonaceous BOD							
BOD Carbonaceous	74		20	mg/L		23-APR-20	R5067521
Chloride in Water by IC							
Chloride (Cl)	79.0		0.50	mg/L		22-APR-20	R5061690
Conductivity							
Conductivity	590		1.0	umhos/cm		24-APR-20	R5064357
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	10100	PEHR	10	MPN/100mL		22-APR-20	R5061563
Note: microbological test resuits for E.coli > Fecal coliforms due to sample heterogeneity.Both test results are within normal variability for MPN tests.							
Hardness Calculated							
Hardness (as CaCO3)	134	HTC	0.20	mg/L		29-APR-20	
Mercury Total							
Mercury (Hg)-Total	0.0000120		0.0000050	mg/L	24-APR-20	24-APR-20	R5063258
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		22-APR-20	R5061690
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		23-APR-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		22-APR-20	R5061690
Oil & Grease - Gravimetric							
Oil and Grease	22.7		5.0	mg/L		28-APR-20	R5067197
Phenol (4AAP)							
Phenols (4AAP)	0.0072		0.0010	mg/L		29-APR-20	R5069376
Phosphorus, Total							
Phosphorus (P)-Total	2.36		0.030	mg/L		24-APR-20	R5067380
Sulfate in Water by IC							
Sulfate (SO4)	39.4		0.30	mg/L		22-APR-20	R5061690
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.168		0.0030	mg/L	27-APR-20	27-APR-20	R5067419
Antimony (Sb)-Total	0.00019		0.00010	mg/L	27-APR-20	27-APR-20	R5067419
Arsenic (As)-Total	0.00103		0.00010	mg/L	27-APR-20	27-APR-20	R5067419
Barium (Ba)-Total	0.0454		0.00010	mg/L	27-APR-20	27-APR-20	R5067419
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	27-APR-20	27-APR-20	R5067419
Bismuth (Bi)-Total	0.00133		0.000050	mg/L	27-APR-20	27-APR-20	R5067419
Boron (B)-Total	0.089		0.010	mg/L	27-APR-20	27-APR-20	R5067419
Cadmium (Cd)-Total	0.000104		0.0000050	mg/L	27-APR-20	27-APR-20	R5067419
Calcium (Ca)-Total	37.0		0.050	mg/L	27-APR-20	27-APR-20	R5067419
Cesium (Cs)-Total	0.000084		0.000010	mg/L	27-APR-20	27-APR-20	R5067419

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

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2439226-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 20-APR-20 @ 10:00							
Matrix: WASTE							
Total Metals in Water by CRC ICPMS							
Chromium (Cr)-Total	0.00073		0.00010	mg/L	27-APR-20	27-APR-20	R5067419
Cobalt (Co)-Total	0.00018		0.00010	mg/L	27-APR-20	27-APR-20	R5067419
Copper (Cu)-Total	0.171		0.00050	mg/L	27-APR-20	27-APR-20	R5067419
Iron (Fe)-Total	0.704		0.010	mg/L	27-APR-20	27-APR-20	R5067419
Lead (Pb)-Total	0.000941		0.000050	mg/L	27-APR-20	27-APR-20	R5067419
Lithium (Li)-Total	0.0044		0.0010	mg/L	27-APR-20	27-APR-20	R5067419
Magnesium (Mg)-Total	9.98		0.0050	mg/L	27-APR-20	27-APR-20	R5067419
Manganese (Mn)-Total	0.0406		0.00010	mg/L	27-APR-20	27-APR-20	R5067419
Molybdenum (Mo)-Total	0.00105		0.000050	mg/L	27-APR-20	27-APR-20	R5067419
Nickel (Ni)-Total	0.00328		0.00050	mg/L	27-APR-20	27-APR-20	R5067419
Potassium (K)-Total	10.9		0.050	mg/L	27-APR-20	27-APR-20	R5067419
Phosphorus (P)-Total	2.75		0.030	mg/L	27-APR-20	27-APR-20	R5067419
Rubidium (Rb)-Total	0.0112		0.00020	mg/L	27-APR-20	27-APR-20	R5067419
Selenium (Se)-Total	0.000323		0.000050	mg/L	27-APR-20	27-APR-20	R5067419
Silicon (Si)-Total	0.43		0.10	mg/L	27-APR-20	27-APR-20	R5067419
Silver (Ag)-Total	0.000062		0.000010	mg/L	27-APR-20	27-APR-20	R5067419
Sodium (Na)-Total	47.5		0.050	mg/L	27-APR-20	27-APR-20	R5067419
Strontium (Sr)-Total	0.185		0.00020	mg/L	27-APR-20	27-APR-20	R5067419
Sulfur (S)-Total	15.2		0.50	mg/L	27-APR-20	27-APR-20	R5067419
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	27-APR-20	27-APR-20	R5067419
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	27-APR-20	27-APR-20	R5067419
Thorium (Th)-Total	<0.00010		0.00010	mg/L	27-APR-20	27-APR-20	R5067419
Tin (Sn)-Total	0.00062		0.00010	mg/L	27-APR-20	27-APR-20	R5067419
Titanium (Ti)-Total	0.00167		0.00030	mg/L	27-APR-20	27-APR-20	R5067419
Tungsten (W)-Total	<0.00010		0.00010	mg/L	27-APR-20	27-APR-20	R5067419
Uranium (U)-Total	0.000175		0.000010	mg/L	27-APR-20	27-APR-20	R5067419
Vanadium (V)-Total	<0.00050		0.00050	mg/L	27-APR-20	27-APR-20	R5067419
Zinc (Zn)-Total	0.0934		0.0030	mg/L	27-APR-20	27-APR-20	R5067419
Zirconium (Zr)-Total	0.00059		0.00020	mg/L	27-APR-20	27-APR-20	R5067419
Total Organic Carbon by Combustion							
Total Organic Carbon	52.3		0.50	mg/L		27-APR-20	R5067320
Total Suspended Solids							
Total Suspended Solids	98.8		2.0	mg/L		27-APR-20	R5067457
pH							
pH	7.20		0.10	pH units		24-APR-20	R5064357

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLCI	Detection Limit Raised: Chromatographic Interference due to co-elution.
EMPC	Estimated Maximum Possible Concentration. Parameter detected but didn't meet all criteria for positive identification.
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.
PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.
VOCHS	VOC analysis was conducted for a water sample that contained > 5% headspace. Results may be biased low.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO3 2-/L.			
ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO3-/L			
ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION
The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.			
ALK-TITR-WP	Water	Alkalinity, Total (as CaCO3)	APHA 2320B
The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO3- and H2CO3 endpoints indicated electrometrically.			
BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B
Samples are diluted and seeded, have TCMP added to inhibit nitrogenous demands, and then are incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.			
BOD-WP	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B
Samples are diluted and seeded and then incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.			
BTEXS+F1-HSMS-WP	Water	BTX plus F1 by GCMS	EPA 8260C / EPA 5021A
The water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transfered into a gas chromatograph. Target compound concentrations are measured using mass spectrometry detection.			
C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP
Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.			
CL-IC-N-WP	Water	Chloride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc			
EC-WP	Water	Conductivity	APHA 2510B
Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.			
F-IC-N-WP	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
F1-F4-CALC-WP	Water	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-L
Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F2-F4-FID-WP	Water	CCME PHC F2-F4 in Water	EPA 3511

Petroleum hydrocarbons in water are determined by liquid-liquid micro-scale solvent extraction using a reciprocal shaker extraction apparatus prior to capillary column gas chromatography with flame ionization detection (GC-FID) analysis.

FC10-QT97-WP	Water	Fecal coliforms, 1:10 dilution by QT97	APHA 9223B QT97

Analysis is carried out using procedures adapted from APHA 9223 "Enzyme Substrate Coliform Test". Fecal (thermotolerant) coliform bacteria are determined by mixing a 1:10 dilution of sample with a product containing hydrolyzable substrates and sealing in a 97-well packet. The packet is incubated at 44.5 +/- 0.2 degrees C for 18 hours and then the number of wells exhibiting positive responses are counted. The final results are obtained by comparing the number of positive responses to a probability table.

HARDNESS-CALC-WP	Water	Hardness Calculated	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-WP	Water	Mercury Total	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020B (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.

NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F

Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.

NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

OG-GRAV-WP	Water	Oil & Grease - Gravimetric	EPA 1664 (modified)

Water samples are acidified and extracted with hexane; the hexane extract is collected in a pre-weighed vial. The solvent is evaporated and Total Oil & Grease is determined from the weight of the residue in the vial.

P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS-L

This analysis is carried out using procedures adapted from APHA METHOD 4500-P "Phosphorus". Total Phosphorus is determined colourmetrically after persulphate digestion of the sample.

PAH,PANH-WP	Water	Polyaromatic Hydrocarbons (PAHs)	EPA 3511/8270D (mod)

PAHs are extracted from water using a hexane micro-extraction technique, with analysis by GC/MS. Because the two isomers cannot be readily separated chromatographically, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
PH-WP	Water	pH	APHA 4500H
The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			
SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
TC,EC10-QT97-WP	Water	Total and E. coli, 1:10 dilution by QT97	APHA 9223B QT97
Analysis is carried out using procedures adapted from APHA 9223 "Enzyme Susbtrate Coliform Test". Total coliforms and Eschericia coli bacteria are simultaneously determined by mixing a 1:10 dilution of sample with a product containing hydrolyzable substrates and sealing in a 97-well packet. The packet is incubated at 35.0 +/- 0.5 degrees C for 18 or 24 hours and then the number of wells exhibiting positive responses are counted. The final results are obtained by comparing the number of positive responses to a probability table.			
XYLENES-SUM-CALC-WP	Water	Sum of Xylene Isomer Concentrations	CALCULATED RESULT
Total xylenes represents the sum of o-xylene and m&p-xylene.			

** 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
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

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.

Quality Control Report

Client: Nunavut Community & Government Services - Rankin Inlet
P.O. Box 490
Rankin Inlet NU X0C 0G0
Contact: SIMON DOIRON (Rankin Inlet)

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-WP	**Water**							
Batch R5064357								
WG3313336-5 DUP		**L2439226-1**						
Alkalinity, Total (as CaCO3)		127	126		mg/L	0.2	20	24-APR-20
WG3313336-4 LCS								
Alkalinity, Total (as CaCO3)			101.7		%		85-115	24-APR-20
WG3313336-1 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	24-APR-20
BOD-CBOD-WP	**Water**							
Batch R5067521								
WG3312132-2 LCS								
BOD Carbonaceous			88.0		%		85-115	23-APR-20
WG3312132-1 MB								
BOD Carbonaceous			<2.0		mg/L		2	23-APR-20
BOD-WP	**Water**							
Batch R5067521								
WG3312132-2 LCS								
Biochemical Oxygen Demand			103.8		%		85-115	23-APR-20
WG3312132-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	23-APR-20
BTEXS+F1-HSMS-WP	**Water**							
Batch R5066839								
WG3312801-4 DUP		**L2439226-1**						
Benzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	23-APR-20
Toluene		0.0010	0.0010		mg/L	0.9	30	23-APR-20
Ethyl benzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	23-APR-20
o-Xylene		0.00095	0.00089		mg/L	6.9	30	23-APR-20
m+p-Xylenes		0.00141	0.00139		mg/L	1.8	30	23-APR-20
F1 (C6-C10)		<0.10	<0.10	RPD-NA	mg/L	N/A	30	23-APR-20
WG3312801-2 LCS								
Benzene			128.2		%		70-130	23-APR-20
Toluene			128.9		%		70-130	23-APR-20
Ethyl benzene			116.6		%		70-130	23-APR-20
o-Xylene			119.0		%		70-130	23-APR-20
m+p-Xylenes			102.7		%		70-130	23-APR-20
WG3312801-3 LCS								
F1 (C6-C10)			111.3		%		70-130	23-APR-20
WG3312801-1 MB								
Benzene			<0.00050		mg/L		0.0005	23-APR-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTEXS+F1-HSMS-WP	**Water**							
Batch R5066839								
WG3312801-1 MB								
Toluene			<0.0010		mg/L		0.001	23-APR-20
Ethyl benzene			<0.00050		mg/L		0.0005	23-APR-20
o-Xylene			<0.00050		mg/L		0.0005	23-APR-20
m+p-Xylenes			<0.00040		mg/L		0.0004	23-APR-20
F1 (C6-C10)			<0.10		mg/L		0.1	23-APR-20
Surrogate: 4-Bromofluorobenzene (SS)			96.1		%		70-130	23-APR-20
WG3312801-5 MS		**L2439226-1**						
Benzene			108.5		%		50-150	23-APR-20
Toluene			91.6		%		50-150	23-APR-20
Ethyl benzene			104.1		%		50-150	23-APR-20
o-Xylene			108.2		%		50-150	23-APR-20
m+p-Xylenes			92.5		%		50-150	23-APR-20
WG3312801-6 MS		**L2439226-1**						
F1 (C6-C10)			95.7		%		50-150	23-APR-20
C-TOC-HTC-WP	**Water**							
Batch R5067320								
WG3314283-2 LCS								
Total Organic Carbon			96.3		%		80-120	27-APR-20
WG3314283-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	27-APR-20
CL-IC-N-WP	**Water**							
Batch R5061690								
WG3311832-6 LCS								
Chloride (Cl)			102.6		%		90-110	22-APR-20
WG3311832-5 MB								
Chloride (Cl)			<0.50		mg/L		0.5	22-APR-20
EC-WP	**Water**							
Batch R5064357								
WG3313336-5 DUP		**L2439226-1**						
Conductivity		590	588		umhos/cm	0.3	10	24-APR-20
WG3313336-3 LCS								
Conductivity			99.3		%		90-110	24-APR-20
WG3313336-1 MB								
Conductivity			<1.0		umhos/cm		1	24-APR-20
F-IC-N-WP	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-WP	**Water**							
Batch R5061690								
WG3311832-6 LCS								
Fluoride (F)			103.7		%		90-110	22-APR-20
WG3311832-5 MB								
Fluoride (F)			<0.020		mg/L		0.02	22-APR-20
F2-F4-FID-WP	**Water**							
Batch R5064119								
WG3312911-2 LCS								
F2 (C10-C16)			96.8		%		70-130	24-APR-20
F3 (C16-C34)			88.5		%		70-130	24-APR-20
F4 (C34-C50)			86.3		%		70-130	24-APR-20
WG3312911-1 MB								
F2 (C10-C16)			<0.10		mg/L		0.1	24-APR-20
F3 (C16-C34)			<0.25		mg/L		0.25	24-APR-20
F4 (C34-C50)			<0.25		mg/L		0.25	24-APR-20
Surrogate: 2-Bromobenzotrifluoride			93.9		%		60-140	24-APR-20
FC10-QT97-WP	**Water**							
Batch R5061563								
WG3311680-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	22-APR-20
HG-T-CVAA-WP	**Water**							
Batch R5063258								
WG3313019-2 LCS								
Mercury (Hg)-Total			112.0		%		80-120	24-APR-20
WG3313019-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	24-APR-20
MET-T-CCMS-WP	**Water**							
Batch R5067419								
WG3313653-2 LCS								
Aluminum (Al)-Total			101.7		%		80-120	27-APR-20
Antimony (Sb)-Total			101.0		%		80-120	27-APR-20
Arsenic (As)-Total			99.4		%		80-120	27-APR-20
Barium (Ba)-Total			104.9		%		80-120	27-APR-20
Beryllium (Be)-Total			94.6		%		80-120	27-APR-20
Bismuth (Bi)-Total			96.2		%		80-120	27-APR-20
Boron (B)-Total			92.4		%		80-120	27-APR-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R5067419								
WG3313653-2 LCS								
Cadmium (Cd)-Total			100.3		%		80-120	27-APR-20
Calcium (Ca)-Total			93.1		%		80-120	27-APR-20
Cesium (Cs)-Total			104.1		%		80-120	27-APR-20
Chromium (Cr)-Total			96.9		%		80-120	27-APR-20
Cobalt (Co)-Total			97.5		%		80-120	27-APR-20
Copper (Cu)-Total			99.3		%		80-120	27-APR-20
Iron (Fe)-Total			91.4		%		80-120	27-APR-20
Lead (Pb)-Total			98.0		%		80-120	27-APR-20
Lithium (Li)-Total			102.4		%		80-120	27-APR-20
Magnesium (Mg)-Total			99.5		%		80-120	27-APR-20
Manganese (Mn)-Total			99.6		%		80-120	27-APR-20
Molybdenum (Mo)-Total			95.7		%		80-120	27-APR-20
Nickel (Ni)-Total			96.4		%		80-120	27-APR-20
Potassium (K)-Total			95.6		%		80-120	27-APR-20
Phosphorus (P)-Total			95.0		%		80-120	27-APR-20
Rubidium (Rb)-Total			105.7		%		80-120	27-APR-20
Selenium (Se)-Total			96.5		%		80-120	27-APR-20
Silicon (Si)-Total			102.3		%		80-120	27-APR-20
Silver (Ag)-Total			98.0		%		80-120	27-APR-20
Sodium (Na)-Total			101.3		%		80-120	27-APR-20
Strontium (Sr)-Total			105.4		%		80-120	27-APR-20
Sulfur (S)-Total			97.6		%		80-120	27-APR-20
Tellurium (Te)-Total			96.2		%		80-120	27-APR-20
Thallium (Tl)-Total			95.4		%		80-120	27-APR-20
Thorium (Th)-Total			97.2		%		80-120	27-APR-20
Tin (Sn)-Total			101.2		%		80-120	27-APR-20
Titanium (Ti)-Total			92.9		%		80-120	27-APR-20
Tungsten (W)-Total			99.2		%		80-120	27-APR-20
Uranium (U)-Total			99.6		%		80-120	27-APR-20
Vanadium (V)-Total			98.8		%		80-120	27-APR-20
Zinc (Zn)-Total			97.4		%		80-120	27-APR-20
Zirconium (Zr)-Total			92.9		%		80-120	27-APR-20
WG3313653-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	27-APR-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R5067419								
WG3313653-1 MB								
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	27-APR-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	27-APR-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	27-APR-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	27-APR-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	27-APR-20
Boron (B)-Total			<0.010		mg/L		0.01	27-APR-20
Cadmium (Cd)-Total			<0.000005C		mg/L		0.000005	27-APR-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	27-APR-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	27-APR-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	27-APR-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	27-APR-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	27-APR-20
Iron (Fe)-Total			<0.010		mg/L		0.01	27-APR-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	27-APR-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	27-APR-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	27-APR-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	27-APR-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	27-APR-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	27-APR-20
Potassium (K)-Total			<0.050		mg/L		0.05	27-APR-20
Phosphorus (P)-Total			<0.030		mg/L		0.03	27-APR-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	27-APR-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	27-APR-20
Silicon (Si)-Total			<0.10		mg/L		0.1	27-APR-20
Silver (Ag)-Total			<0.000010		mg/L		0.00001	27-APR-20
Sodium (Na)-Total			<0.050		mg/L		0.05	27-APR-20
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	27-APR-20
Sulfur (S)-Total			<0.50		mg/L		0.5	27-APR-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	27-APR-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	27-APR-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	27-APR-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	27-APR-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	27-APR-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	27-APR-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R5067419								
WG3313653-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	27-APR-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	27-APR-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	27-APR-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	27-APR-20
NH3-COL-WP	**Water**							
Batch R5064276								
WG3313320-10 LCS								
Ammonia, Total (as N)			101.7		%		85-115	24-APR-20
WG3313320-9 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	24-APR-20
NO2-IC-N-WP	**Water**							
Batch R5061690								
WG3311832-6 LCS								
Nitrite (as N)			105.2		%		90-110	22-APR-20
WG3311832-5 MB								
Nitrite (as N)			<0.010		mg/L		0.01	22-APR-20
NO3-IC-N-WP	**Water**							
Batch R5061690								
WG3311832-6 LCS								
Nitrate (as N)			105.0		%		90-110	22-APR-20
WG3311832-5 MB								
Nitrate (as N)			<0.020		mg/L		0.02	22-APR-20
OG-GRAV-WP	**Water**							
Batch R5067197								
WG3313300-2 LCS								
Oil and Grease			86.7		%		70-130	28-APR-20
WG3313300-1 MB								
Oil and Grease			<5.0		mg/L		5	28-APR-20
P-T-COL-WP	**Water**							
Batch R5067380								
WG3312757-6 LCS								
Phosphorus (P)-Total			96.2		%		80-120	24-APR-20
WG3312757-5 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	24-APR-20
PAH,PANH-WP	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH,PANH-WP	**Water**							
Batch R5066061								
WG3313021-2 LCS								
1-Methyl Naphthalene			94.5		%		60-130	27-APR-20
2-Methyl Naphthalene			83.5		%		60-130	27-APR-20
Acenaphthene			97.8		%		60-130	27-APR-20
Acenaphthylene			88.2		%		60-130	27-APR-20
Anthracene			87.7		%		60-130	27-APR-20
Acridine			79.7		%		60-130	27-APR-20
Benzo(a)anthracene			85.1		%		60-130	27-APR-20
Benzo(a)pyrene			86.9		%		60-130	27-APR-20
Benzo(b&j)fluoranthene			106.2		%		60-130	27-APR-20
Benzo(g,h,i)perylene			90.4		%		60-130	27-APR-20
Benzo(k)fluoranthene			101.5		%		60-130	27-APR-20
Chrysene			87.1		%		60-130	27-APR-20
Dibenzo(a,h)anthracene			89.6		%		60-130	27-APR-20
Fluoranthene			91.6		%		60-130	27-APR-20
Fluorene			89.5		%		60-130	27-APR-20
Indeno(1,2,3-cd)pyrene			88.3		%		60-130	27-APR-20
Naphthalene			93.7		%		50-130	27-APR-20
Phenanthrene			96.2		%		60-130	27-APR-20
Pyrene			93.2		%		60-130	27-APR-20
Quinoline			106.1		%		60-130	27-APR-20
WG3313021-1 MB								
1-Methyl Naphthalene			<0.000020		mg/L		0.00002	27-APR-20
2-Methyl Naphthalene			<0.000020		mg/L		0.00002	27-APR-20
Acenaphthene			<0.000020		mg/L		0.00002	27-APR-20
Acenaphthylene			<0.000020		mg/L		0.00002	27-APR-20
Anthracene			<0.000010		mg/L		0.00001	27-APR-20
Acridine			<0.000020		mg/L		0.00002	27-APR-20
Benzo(a)anthracene			<0.000010		mg/L		0.00001	27-APR-20
Benzo(a)pyrene			<0.000005		mg/L		0.000005	27-APR-20
Benzo(b&j)fluoranthene			<0.000010		mg/L		0.00001	27-APR-20
Benzo(g,h,i)perylene			<0.000020		mg/L		0.00002	27-APR-20
Benzo(k)fluoranthene			<0.000010		mg/L		0.00001	27-APR-20
Chrysene			<0.000020		mg/L		0.00002	27-APR-20
Dibenzo(a,h)anthracene			<0.000005		mg/L		0.000005	27-APR-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH,PANH-WP	**Water**							
Batch R5066061								
WG3313021-1 MB								
Fluoranthene			<0.000020		mg/L		0.00002	27-APR-20
Fluorene			<0.000020		mg/L		0.00002	27-APR-20
Indeno(1,2,3-cd)pyrene			<0.000010		mg/L		0.00001	27-APR-20
Naphthalene			<0.000050		mg/L		0.00005	27-APR-20
Phenanthrene			<0.000050		mg/L		0.00005	27-APR-20
Pyrene			<0.000010		mg/L		0.00001	27-APR-20
Quinoline			<0.000020		mg/L		0.00002	27-APR-20
Surrogate: Acenaphthene d10			86.2		%		60-130	27-APR-20
Surrogate: Acridine d9			71.0		%		60-130	27-APR-20
Surrogate: Chrysene d12			75.7		%		60-130	27-APR-20
Surrogate: Naphthalene d8			81.5		%		50-130	27-APR-20
Surrogate: Phenanthrene d10			82.9		%		60-130	27-APR-20
PH-WP	**Water**							
Batch R5064357								
WG3313336-5 DUP		**L2439226-1**						
pH		7.20	7.21	J	pH units	0.01	0.2	24-APR-20
WG3313336-2 LCS								
pH			7.39		pH units		7.3-7.5	24-APR-20
PHENOLS-4AAP-WT	**Water**							
Batch R5069376								
WG3314652-2 LCS								
Phenols (4AAP)			98.9		%		85-115	29-APR-20
WG3314652-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	29-APR-20
SO4-IC-N-WP	**Water**							
Batch R5061690								
WG3311832-6 LCS								
Sulfate (SO4)			105.0		%		90-110	22-APR-20
WG3311832-5 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	22-APR-20
SOLIDS-TOTSUS-WP	**Water**							
Batch R5067457								
WG3313684-6 LCS								
Total Suspended Solids			107.5		%		85-115	27-APR-20
WG3313684-5 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TOTSUS-WP	**Water**							
Batch R5067457								
WG3313684-5 MB								
Total Suspended Solids			<2.0		mg/L		2	27-APR-20
TC,EC10-QT97-WP	**Water**							
Batch R5061477								
WG3311678-2 DUP		**L2439226-1**						
Total Coliforms		>24200	>24200		MPN/100mL	0.0	65	22-APR-20
Escherichia Coli		>24200	>24200		MPN/100mL	0.0	65	22-APR-20
WG3311678-1 MB								
Total Coliforms			<1		MPN/100mL		1	22-APR-20
Escherichia Coli			<1		MPN/100mL		1	22-APR-20

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
J	Duplicate results and limits are expressed in terms of absolute difference.
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							
pH							
	1	20-APR-20 10:00	24-APR-20 12:00	0.25	98	hours	EHTR-FM
Bacteriological Tests							
Fecal coliforms, 1:10 dilution by QT97							
	1	20-APR-20 10:00	22-APR-20 13:15	30	51	hours	EHTR
Total and E. coli, 1:10 dilution by QT97							
	1	20-APR-20 10:00	22-APR-20 13:15	30	51	hours	EHTR
Aggregate Organics							
Biochemical Oxygen Demand (BOD)							
	1	20-APR-20 10:00	23-APR-20 07:00	48	69	hours	EHTR
Carbonaceous BOD							
	1	20-APR-20 10:00	23-APR-20 07:00	48	69	hours	EHTR

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 L2439226 were received on 22-APR-20 11:30.

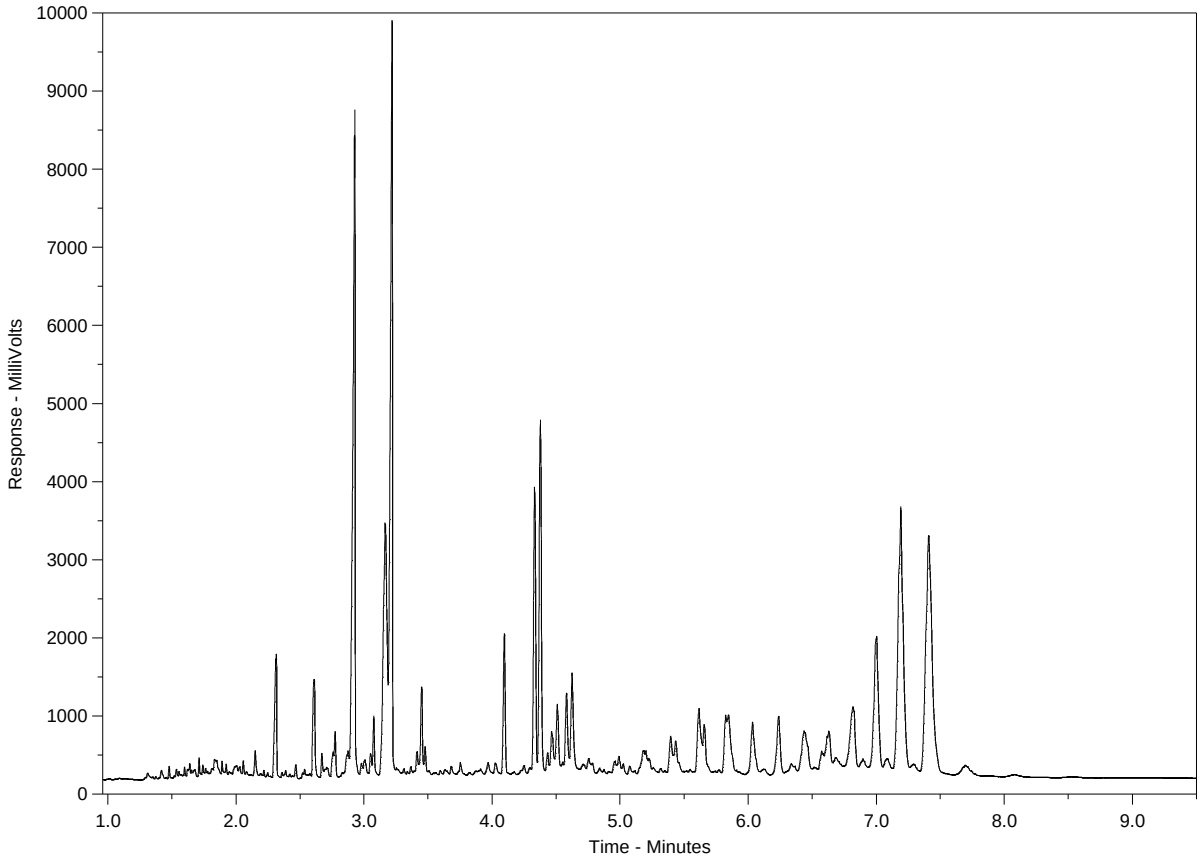
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where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

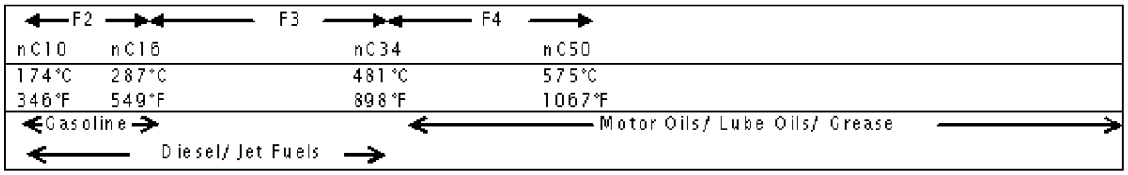
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2439226-1
Client Sample ID: RANKIN INLET WWTP - EFFLUENT





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

ALS Environmental

L2439226-COFC

COC # _____

Page ___ of ___

Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)
Company:	Nunavut CGS - Rankin Inlet (W8133)	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	SIMON DOIRON	☑ PDF ☐ Excel ☐ Digital ☐ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	Box 490	Email 1: sdoiron@gov.nu.ca		○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Rankin Inlet , NU, X0C 0G0	Email 2: mlusty@gov.nu.ca		○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	867-645-8155 Cell# :	Email 3:		
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information		Analysis Request
Hardcopy of Invoice with Report?	☐ Yes ☐ No	Job #:	Rankin Inlet WWTP- Monthly Effluent	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:		PO / AFE:		
Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)		ALS Contact:	Craig Riddell	Sampled By: Simon Doiron

Sample #	Sample Identification (This description will appear on the report)	Date Sampled	Time Sampled	Sample Type	BTX,F1-F4-WP	PAH,PANH-WP	NUNAVUT-WW-GRP1-WP	F-IC-N-WP	TC,EC-QT97-WP	Number of Containers
	Rankin Inlet WWTP - Effluent	04/20/20	10:00 AM	Waste	x	x	x	x	x	15
	**NOTE TO LOGIN - remove metals Reporting Code WP-NUNAVUT-WW-GRP1									
	So all ICP-MS metals report.									

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Nunavut-WW-GRP1-WP pkg includes 1 L BOD/CBOD, 1 L Routine, 250 ml Metals , 40 ml Mercury Vial, 250 ml Amber Nutrient , 250 ml Amber Phenols, 2 x 250 ml Amber Oil & Grease , 250 ml Bacteria (9 bottles) + 5 Vials for BTX,F1-F4 and 1 L Amber for PAH's = Total of 15 Bottles per sample.

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 provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Bill Ross	April 20/20	10:00 Am		APR 22 2020	1130	9.6 °C				

GENF 18.01 Front

Nunavut Community & Government Services - Rankin Inlet
ATTN: SIMON DOIRON (Rankin Inlet)
P.O. Box 490
Rankin Inlet NU X0C 0G0

Date Received: 14-MAY-20
Report Date: 03-JUN-20 15:54 (MT)
Version: FINAL

Client Phone: 867-645-8155

Certificate of Analysis

Lab Work Order #: L2447730

Project P.O. #: NOT SUBMITTED
Job Reference: RANKIN INLET WWTP - MONTHLY EFFLUENT
C of C Numbers:
Legal Site Desc:

Comments: NOTE: 40 ml Glass Mercury Vial was submitted empty

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2447730-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 13-MAY-20 @ 10:00							
Matrix: WASTE							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050	VOCHS	0.00050	mg/L		21-MAY-20	R5094457
Toluene	<0.0010	VOCHS	0.0010	mg/L		21-MAY-20	R5094457
Ethyl benzene	<0.00050	VOCHS	0.00050	mg/L		21-MAY-20	R5094457
o-Xylene	<0.00050	VOCHS	0.00050	mg/L		21-MAY-20	R5094457
m+p-Xylenes	<0.00040	VOCHS	0.00040	mg/L		21-MAY-20	R5094457
F1 (C6-C10)	<0.10	VOCHS	0.10	mg/L		21-MAY-20	R5094457
Surrogate: 4-Bromofluorobenzene (SS)	87.1		70-130	%		21-MAY-20	R5094457
CCME PHC F2-F4 in Water							
F2 (C10-C16)	0.51		0.10	mg/L	15-MAY-20	15-MAY-20	R5088817
F3 (C16-C34)	10.5		0.25	mg/L	15-MAY-20	15-MAY-20	R5088817
F4 (C34-C50)	3.12		0.25	mg/L	15-MAY-20	15-MAY-20	R5088817
Surrogate: 2-Bromobenzotrifluoride	91.7		60-140	%	15-MAY-20	15-MAY-20	R5088817
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		27-MAY-20	
F2-Naphth	0.51		0.10	mg/L		27-MAY-20	
F3-PAH	10.5		0.25	mg/L		27-MAY-20	
Total Hydrocarbons (C6-C50)	14.2		0.38	mg/L		27-MAY-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		27-MAY-20	
Miscellaneous Parameters							
Fluoride (F)	0.157		0.020	mg/L		15-MAY-20	R5088896
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	>24200		10	MPN/100mL		14-MAY-20	R5087397
Escherichia Coli	>24200		10	MPN/100mL		14-MAY-20	R5087397
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	19-MAY-20	21-MAY-20	R5095314
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	19-MAY-20	21-MAY-20	R5095314
Acenaphthene	<0.000020		0.000020	mg/L	19-MAY-20	21-MAY-20	R5095314
Acenaphthylene	<0.000020		0.000020	mg/L	19-MAY-20	21-MAY-20	R5095314
Anthracene	<0.000010		0.000010	mg/L	19-MAY-20	21-MAY-20	R5095314
Acridine	<0.000020		0.000020	mg/L	19-MAY-20	21-MAY-20	R5095314
Benzo(a)anthracene	<0.000010		0.000010	mg/L	19-MAY-20	21-MAY-20	R5095314
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	19-MAY-20	21-MAY-20	R5095314
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	19-MAY-20	21-MAY-20	R5095314
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	19-MAY-20	21-MAY-20	R5095314
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	19-MAY-20	21-MAY-20	R5095314
Chrysene	<0.000020		0.000020	mg/L	19-MAY-20	21-MAY-20	R5095314
Dibenzo(a,h)anthracene	<0.000010	DLCI	0.000010	mg/L	19-MAY-20	21-MAY-20	R5095314
Fluoranthene	<0.000020		0.000020	mg/L	19-MAY-20	21-MAY-20	R5095314
Fluorene	<0.000020		0.000020	mg/L	19-MAY-20	21-MAY-20	R5095314
Indeno(1,2,3-cd)pyrene	<0.00020	DLCI	0.00020	mg/L	19-MAY-20	21-MAY-20	R5095314
Naphthalene	<0.000050		0.000050	mg/L	19-MAY-20	21-MAY-20	R5095314
Phenanthrene	<0.000050		0.000050	mg/L	19-MAY-20	21-MAY-20	R5095314
Pyrene	<0.000010		0.000010	mg/L	19-MAY-20	21-MAY-20	R5095314
Quinoline	<0.000020		0.000020	mg/L	19-MAY-20	21-MAY-20	R5095314
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	19-MAY-20	21-MAY-20	R5095314
Surrogate: Acenaphthene d10	97.4		60-130	%	19-MAY-20	21-MAY-20	R5095314
Surrogate: Acridine d9	99.0		60-130	%	19-MAY-20	21-MAY-20	R5095314
Surrogate: Chrysene d12	72.5		60-130	%	19-MAY-20	21-MAY-20	R5095314
Surrogate: Naphthalene d8	98.8		50-130	%	19-MAY-20	21-MAY-20	R5095314
Surrogate: Phenanthrene d10	104.4		60-130	%	19-MAY-20	21-MAY-20	R5095314

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2447730-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 13-MAY-20 @ 10:00							
Matrix: WASTE							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	171		1.2	mg/L		19-MAY-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		19-MAY-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		19-MAY-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	140		1.0	mg/L		16-MAY-20	R5091376
Ammonia by colour							
Ammonia, Total (as N)	7.1		2.0	mg/L		27-MAY-20	R5100140
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	119		50	mg/L		15-MAY-20	R5094945
Carbonaceous BOD							
BOD Carbonaceous	113		20	mg/L		15-MAY-20	R5094945
Chloride in Water by IC							
Chloride (Cl)	81.5		0.50	mg/L		15-MAY-20	R5088896
Conductivity							
Conductivity	610		1.0	umhos/cm		16-MAY-20	R5091376
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	>24200		10	MPN/100mL		14-MAY-20	R5087436
Hardness Calculated							
Hardness (as CaCO3)	139	HTC	0.20	mg/L		28-MAY-20	
Mercury Total							
Mercury (Hg)-Total	0.0000160		0.0000050	mg/L	03-JUN-20	03-JUN-20	R5105440
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		15-MAY-20	R5088896
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		19-MAY-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		15-MAY-20	R5088896
Oil & Grease - Gravimetric							
Oil and Grease	25.0		5.0	mg/L		28-MAY-20	R5099959
Phenol (4AAP)							
Phenols (4AAP)	0.0096		0.0010	mg/L		22-MAY-20	R5096321
Phosphorus, Total							
Phosphorus (P)-Total	2.82		0.030	mg/L		22-MAY-20	R5095073
Sulfate in Water by IC							
Sulfate (SO4)	38.6		0.30	mg/L		15-MAY-20	R5088896
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.195		0.0030	mg/L	27-MAY-20	27-MAY-20	R5099341
Arsenic (As)-Total	0.00106		0.00010	mg/L	27-MAY-20	27-MAY-20	R5099341
Cadmium (Cd)-Total	0.000130		0.0000050	mg/L	27-MAY-20	27-MAY-20	R5099341
Calcium (Ca)-Total	38.7		0.050	mg/L	27-MAY-20	27-MAY-20	R5099341
Chromium (Cr)-Total	0.00100		0.00010	mg/L	27-MAY-20	27-MAY-20	R5099341
Cobalt (Co)-Total	0.00023		0.00010	mg/L	27-MAY-20	27-MAY-20	R5099341
Copper (Cu)-Total	0.214		0.00050	mg/L	27-MAY-20	27-MAY-20	R5099341
Iron (Fe)-Total	0.741		0.010	mg/L	27-MAY-20	27-MAY-20	R5099341
Lead (Pb)-Total	0.000973		0.000050	mg/L	27-MAY-20	27-MAY-20	R5099341
Magnesium (Mg)-Total	10.2		0.0050	mg/L	27-MAY-20	27-MAY-20	R5099341
Manganese (Mn)-Total	0.0438		0.00010	mg/L	27-MAY-20	27-MAY-20	R5099341
Nickel (Ni)-Total	0.00333		0.00050	mg/L	27-MAY-20	27-MAY-20	R5099341
Potassium (K)-Total	10.0		0.050	mg/L	27-MAY-20	27-MAY-20	R5099341

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2447730-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 13-MAY-20 @ 10:00							
Matrix: WASTE							
Total Metals in Water by CRC ICPMS							
Sodium (Na)-Total	49.6		0.050	mg/L	27-MAY-20	27-MAY-20	R5099341
Zinc (Zn)-Total	0.0965		0.0030	mg/L	27-MAY-20	27-MAY-20	R5099341
Total Organic Carbon by Combustion							
Total Organic Carbon	58.0		5.0	mg/L		19-MAY-20	R5092910
Total Suspended Solids							
Total Suspended Solids	102		6.0	mg/L		20-MAY-20	R5094530
pH							
pH	7.18		0.10	pH units		16-MAY-20	R5091376

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLCI	Detection Limit Raised: Chromatographic Interference due to co-elution.
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.
VOCHS	VOC analysis was conducted for a water sample that contained > 5% headspace. Results may be biased low.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO3 2-/L.

ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO3-/L

ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.

ALK-TITR-WP	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO3- and H2CO3 endpoints indicated electrometrically.

BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B

Samples are diluted and seeded, have TCMP added to inhibit nitrogenous demands, and then are incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.

BOD-WP	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B

Samples are diluted and seeded and then incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.

BTEXS+F1-HSMS-WP	Water	BTX plus F1 by GCMS	EPA 8260C / EPA 5021A

The water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transfered into a gas chromatograph. Target compound concentrations are measured using mass spectrometry detection.

C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP

Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.

CL-IC-N-WP	Water	Chloride in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc

EC-WP	Water	Conductivity	APHA 2510B

Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.

F-IC-N-WP	Water	Fluoride in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

F1-F4-CALC-WP	Water	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F2-F4-FID-WP	Water	CCME PHC F2-F4 in Water	EPA 3511

Petroleum hydrocarbons in water are determined by liquid-liquid micro-scale solvent extraction using a reciprocal shaker extraction apparatus prior to capillary column gas chromatography with flame ionization detection (GC-FID) analysis.

FC10-QT97-WP	Water	Fecal coliforms, 1:10 dilution by QT97	APHA 9223B QT97

Analysis is carried out using procedures adapted from APHA 9223 "Enzyme Substrate Coliform Test". Fecal (thermotolerant) coliform bacteria are determined by mixing a 1:10 dilution of sample with a product containing hydrolyzable substrates and sealing in a 97-well packet. The packet is incubated at 44.5 +/- 0.2 degrees C for 18 hours and then the number of wells exhibiting positive responses are counted. The final results are obtained by comparing the number of positive responses to a probability table.

HARDNESS-CALC-WP	Water	Hardness Calculated	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-WP	Water	Mercury Total	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020B (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.

NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F

Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.

NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

OG-GRAV-WP	Water	Oil & Grease - Gravimetric	EPA 1664 (modified)

Water samples are acidified and extracted with hexane; the hexane extract is collected in a pre-weighed vial. The solvent is evaporated and Total Oil & Grease is determined from the weight of the residue in the vial.

P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS-L

This analysis is carried out using procedures adapted from APHA METHOD 4500-P "Phosphorus". Total Phosphorus is determined colourmetrically after persulphate digestion of the sample.

PAH,PANH-WP	Water	Polyaromatic Hydrocarbons (PAHs)	EPA 3511/8270D (mod)

PAHs are extracted from water using a hexane micro-extraction technique, with analysis by GC/MS. Because the two isomers cannot be readily separated chromatographically, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

PH-WP	Water	pH	APHA 4500H

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			
SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
TC,EC10-QT97-WP	Water	Total and E. coli, 1:10 dilution by QT97	APHA 9223B QT97
Analysis is carried out using procedures adapted from APHA 9223 "Enzyme Susbtrate Coliform Test". Total coliforms and Eschericia coli bacteria are simultaneously determined by mixing a 1:10 dilution of sample with a product containing hydrolyzable substrates and sealing in a 97-well packet. The packet is incubated at 35.0 +/- 0.5 degrees C for 18 or 24 hours and then the number of wells exhibiting positive responses are counted. The final results are obtained by comparing the number of positive responses to a probability table.			
XYLENES-SUM-CALC-WP	Water	Sum of Xylene Isomer Concentrations	CALCULATED RESULT
Total xylenes represents the sum of o-xylene and m&p-xylene.			

** 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
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

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.

Quality Control Report

Client: Nunavut Community & Government Services - Rankin Inlet
P.O. Box 490
Rankin Inlet NU X0C 0G0
Contact: SIMON DOIRON (Rankin Inlet)

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-WP	**Water**							
Batch R5091376								
WG3325249-9 LCS								
Alkalinity, Total (as CaCO3)			103.2		%		85-115	16-MAY-20
WG3325249-6 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	16-MAY-20
BOD-CBOD-WP	**Water**							
Batch R5094945								
WG3323930-7 LCS								
BOD Carbonaceous			102.1		%		85-115	15-MAY-20
WG3323930-6 MB								
BOD Carbonaceous			<2.0		mg/L		2	15-MAY-20
BOD-WP	**Water**							
Batch R5094945								
WG3323930-7 LCS								
Biochemical Oxygen Demand			100.7		%		85-115	15-MAY-20
WG3323930-6 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	15-MAY-20
BTEXS+F1-HSMS-WP	**Water**							
Batch R5094457								
WG3324277-2 LCS								
Benzene			94.1		%		70-130	20-MAY-20
Toluene			101.1		%		70-130	20-MAY-20
Ethyl benzene			105.5		%		70-130	20-MAY-20
o-Xylene			107.0		%		70-130	20-MAY-20
m+p-Xylenes			102.7		%		70-130	20-MAY-20
WG3324277-3 LCS								
F1 (C6-C10)			109.2		%		70-130	20-MAY-20
WG3324277-1 MB								
Benzene			<0.00050		mg/L		0.0005	20-MAY-20
Toluene			<0.0010		mg/L		0.001	20-MAY-20
Ethyl benzene			<0.00050		mg/L		0.0005	20-MAY-20
o-Xylene			<0.00050		mg/L		0.0005	20-MAY-20
m+p-Xylenes			<0.00040		mg/L		0.0004	20-MAY-20
F1 (C6-C10)			<0.10		mg/L		0.1	20-MAY-20
Surrogate: 4-Bromofluorobenzene (SS)			90.2		%		70-130	20-MAY-20
C-TOC-HTC-WP	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-TOC-HTC-WP	**Water**							
Batch R5092910								
WG3325991-2 LCS								
Total Organic Carbon			89.9		%		80-120	19-MAY-20
WG3325991-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	19-MAY-20
CL-IC-N-WP	**Water**							
Batch R5088896								
WG3324260-2 LCS								
Chloride (Cl)			100.5		%		90-110	15-MAY-20
WG3324260-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	15-MAY-20
EC-WP	**Water**							
Batch R5091376								
WG3325249-8 LCS								
Conductivity			96.0		%		90-110	16-MAY-20
WG3325249-6 MB								
Conductivity			<1.0		umhos/cm		1	16-MAY-20
F-IC-N-WP	**Water**							
Batch R5088896								
WG3324260-2 LCS								
Fluoride (F)			99.7		%		90-110	15-MAY-20
WG3324260-1 MB								
Fluoride (F)			<0.020		mg/L		0.02	15-MAY-20
F2-F4-FID-WP	**Water**							
Batch R5088817								
WG3324272-2 LCS								
F2 (C10-C16)			104.4		%		70-130	15-MAY-20
F3 (C16-C34)			93.9		%		70-130	15-MAY-20
F4 (C34-C50)			95.0		%		70-130	15-MAY-20
WG3324272-1 MB								
F2 (C10-C16)			<0.10		mg/L		0.1	15-MAY-20
F3 (C16-C34)			<0.25		mg/L		0.25	15-MAY-20
F4 (C34-C50)			<0.25		mg/L		0.25	15-MAY-20
Surrogate: 2-Bromobenzotrifluoride			87.2		%		60-140	15-MAY-20
FC10-QT97-WP	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
FC10-QT97-WP	**Water**							
Batch R5087436								
WG3323749-2 DUP		**L2447730-1**						
Fecal Coliforms		>24200	>24200		MPN/100mL	0.0	65	14-MAY-20
WG3323749-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	14-MAY-20
HG-T-CVAA-WP	**Water**							
Batch R5105440								
WG3334607-2 LCS								
Mercury (Hg)-Total			97.0		%		80-120	03-JUN-20
WG3334607-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	03-JUN-20
WG3334607-4 MS		**L2447730-1**						
Mercury (Hg)-Total			92.0		%		70-130	03-JUN-20
MET-T-CCMS-WP	**Water**							
Batch R5099341								
WG3329808-2 LCS								
Aluminum (Al)-Total			104.7		%		80-120	27-MAY-20
Arsenic (As)-Total			102.8		%		80-120	27-MAY-20
Cadmium (Cd)-Total			102.9		%		80-120	27-MAY-20
Calcium (Ca)-Total			101.1		%		80-120	27-MAY-20
Chromium (Cr)-Total			103.6		%		80-120	27-MAY-20
Cobalt (Co)-Total			102.2		%		80-120	27-MAY-20
Copper (Cu)-Total			104.0		%		80-120	27-MAY-20
Iron (Fe)-Total			99.7		%		80-120	27-MAY-20
Lead (Pb)-Total			102.3		%		80-120	27-MAY-20
Magnesium (Mg)-Total			112.9		%		80-120	27-MAY-20
Manganese (Mn)-Total			104.5		%		80-120	27-MAY-20
Nickel (Ni)-Total			101.6		%		80-120	27-MAY-20
Potassium (K)-Total			104.3		%		80-120	27-MAY-20
Sodium (Na)-Total			106.2		%		80-120	27-MAY-20
Zinc (Zn)-Total			104.6		%		80-120	27-MAY-20
WG3329808-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	27-MAY-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	27-MAY-20
Cadmium (Cd)-Total			<0.000005C		mg/L		0.000005	27-MAY-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	27-MAY-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	27-MAY-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R5099341								
WG3329808-1 MB								
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	27-MAY-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	27-MAY-20
Iron (Fe)-Total			<0.010		mg/L		0.01	27-MAY-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	27-MAY-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	27-MAY-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	27-MAY-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	27-MAY-20
Potassium (K)-Total			<0.050		mg/L		0.05	27-MAY-20
Sodium (Na)-Total			<0.050		mg/L		0.05	27-MAY-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	27-MAY-20
NH3-COL-WP	**Water**							
Batch R5100140								
WG3330955-6 LCS								
Ammonia, Total (as N)			99.4		%		85-115	26-MAY-20
WG3330955-5 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	26-MAY-20
NO2-IC-N-WP	**Water**							
Batch R5088896								
WG3324260-2 LCS								
Nitrite (as N)			109.4		%		90-110	15-MAY-20
WG3324260-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	15-MAY-20
NO3-IC-N-WP	**Water**							
Batch R5088896								
WG3324260-2 LCS								
Nitrate (as N)			100.1		%		90-110	15-MAY-20
WG3324260-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	15-MAY-20
OG-GRAV-WP	**Water**							
Batch R5099959								
WG3329888-2 LCS								
Oil and Grease			83.8		%		70-130	28-MAY-20
WG3329888-1 MB								
Oil and Grease			<5.0		mg/L		5	28-MAY-20
P-T-COL-WP	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-WP	**Water**							
Batch R5095073								
WG3327225-10 LCS								
Phosphorus (P)-Total			94.0		%		80-120	22-MAY-20
WG3327225-9 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	22-MAY-20
PAH,PANH-WP	**Water**							
Batch R5095314								
WG3325447-2 LCS								
1-Methyl Naphthalene			81.3		%		60-130	21-MAY-20
2-Methyl Naphthalene			77.0		%		60-130	21-MAY-20
Acenaphthene			91.1		%		60-130	21-MAY-20
Acenaphthylene			87.8		%		60-130	21-MAY-20
Anthracene			96.2		%		60-130	21-MAY-20
Acridine			97.8		%		60-130	21-MAY-20
Benzo(a)anthracene			119.9		%		60-130	21-MAY-20
Benzo(a)pyrene			106.6		%		60-130	21-MAY-20
Benzo(b&j)fluoranthene			114.8		%		60-130	21-MAY-20
Benzo(g,h,i)perylene			123.0		%		60-130	21-MAY-20
Benzo(k)fluoranthene			111.0		%		60-130	21-MAY-20
Chrysene			124.5		%		60-130	21-MAY-20
Dibenzo(a,h)anthracene			113.9		%		60-130	21-MAY-20
Fluoranthene			103.4		%		60-130	21-MAY-20
Fluorene			92.3		%		60-130	21-MAY-20
Indeno(1,2,3-cd)pyrene			114.1		%		60-130	21-MAY-20
Naphthalene			80.5		%		50-130	21-MAY-20
Phenanthrene			99.8		%		60-130	21-MAY-20
Pyrene			108.6		%		60-130	21-MAY-20
Quinoline			100.5		%		60-130	21-MAY-20
WG3325447-1 MB								
1-Methyl Naphthalene			<0.000020		mg/L		0.00002	21-MAY-20
2-Methyl Naphthalene			<0.000020		mg/L		0.00002	21-MAY-20
Acenaphthene			<0.000020		mg/L		0.00002	21-MAY-20
Acenaphthylene			<0.000020		mg/L		0.00002	21-MAY-20
Anthracene			<0.000010		mg/L		0.00001	21-MAY-20
Acridine			<0.000020		mg/L		0.00002	21-MAY-20
Benzo(a)anthracene			<0.000010		mg/L		0.00001	21-MAY-20
Benzo(a)pyrene			<0.000005		mg/L		0.000005	21-MAY-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH,PANH-WP	**Water**							
Batch R5095314								
WG3325447-1 MB								
Benzo(b&j)fluoranthene			<0.000010		mg/L		0.00001	21-MAY-20
Benzo(g,h,i)perylene			<0.000020		mg/L		0.00002	21-MAY-20
Benzo(k)fluoranthene			<0.000010		mg/L		0.00001	21-MAY-20
Chrysene			<0.000020		mg/L		0.00002	21-MAY-20
Dibenzo(a,h)anthracene			<0.000005		mg/L		0.000005	21-MAY-20
Fluoranthene			<0.000020		mg/L		0.00002	21-MAY-20
Fluorene			<0.000020		mg/L		0.00002	21-MAY-20
Indeno(1,2,3-cd)pyrene			<0.000010		mg/L		0.00001	21-MAY-20
Naphthalene			<0.000050		mg/L		0.00005	21-MAY-20
Phenanthrene			<0.000050		mg/L		0.00005	21-MAY-20
Pyrene			<0.000010		mg/L		0.00001	21-MAY-20
Quinoline			<0.000020		mg/L		0.00002	21-MAY-20
Surrogate: Acenaphthene d10			98.5		%		60-130	21-MAY-20
Surrogate: Acridine d9			102.2		%		60-130	21-MAY-20
Surrogate: Chrysene d12			113.6		%		60-130	21-MAY-20
Surrogate: Naphthalene d8			88.9		%		50-130	21-MAY-20
Surrogate: Phenanthrene d10			97.3		%		60-130	21-MAY-20
PH-WP	**Water**							
Batch R5091376								
WG3325249-7 LCS								
pH			7.37		pH units		7.3-7.5	16-MAY-20
PHENOLS-4AAP-WT	**Water**							
Batch R5096321								
WG3327045-2 LCS								
Phenols (4AAP)			99.9		%		85-115	22-MAY-20
WG3327045-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	22-MAY-20
SO4-IC-N-WP	**Water**							
Batch R5088896								
WG3324260-2 LCS								
Sulfate (SO4)			102.2		%		90-110	15-MAY-20
WG3324260-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	15-MAY-20
SOLIDS-TOTSUS-WP	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TOTSUS-WP	**Water**							
Batch R5094530								
WG3325898-6 LCS								
Total Suspended Solids			98.1		%		85-115	20-MAY-20
WG3325898-5 MB								
Total Suspended Solids			<2.0		mg/L		2	20-MAY-20
TC,EC10-QT97-WP	**Water**							
Batch R5087397								
WG3323757-2 DUP		**L2447730-1**						
Total Coliforms		>24200	>24200		MPN/100mL	0.0	65	14-MAY-20
Escherichia Coli		>24200	>24200		MPN/100mL	0.0	65	14-MAY-20
WG3323757-1 MB								
Total Coliforms			<1		MPN/100mL		1	14-MAY-20
Escherichia Coli			<1		MPN/100mL		1	14-MAY-20

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

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	1	13-MAY-20 10:00	16-MAY-20 12:00	0.25	74	hours	EHTR-FM
Bacteriological Tests							
Fecal coliforms, 1:10 dilution by QT97							
	1	13-MAY-20 10:00	14-MAY-20 18:35	30	33	hours	EHTL
Total and E. coli, 1:10 dilution by QT97							
	1	13-MAY-20 10:00	14-MAY-20 18:35	30	33	hours	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 L2447730 were received on 14-MAY-20 12:25.

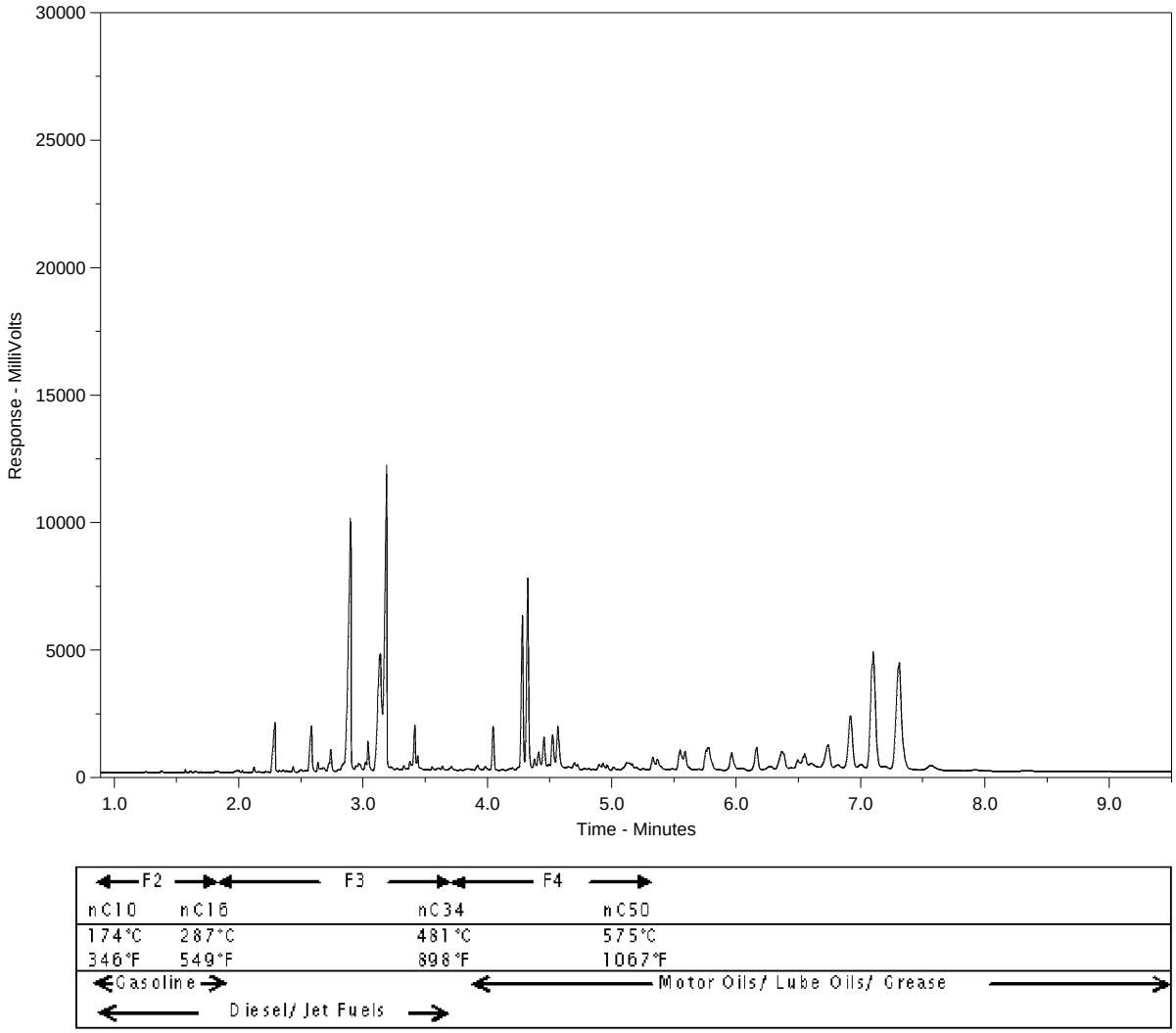
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2447730-1
Client Sample ID: RANKIN INLET WWTP - EFFLUENT



The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

ALS Environmental

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

COC # _____

Page ____ of ____

Report To				**Report Format / Distribution**				**Service Requested** (Rush for routine analysis subject to availability)
Company:	Nunavut CGS - Rankin Inlet (W8133)			☑ Standard ☐ Other				◉ Regul
Contact:	SIMON DOIRON			☑ PDF ☐ Excel ☐ Digital ☐ Fax				○ Priorit
Address:	Box 490			Email 1: sdoiron@gov.nu.ca				○ Emer
	Rankin Inlet , NU, X0C 0G0			Email 2: scollins@gov.nu.ca				○ Same
Phone:	867-645-8155	Cell# :		Email 3: mlusty@gov.nu.ca				
Invoice To	Same as Report ?	☑ Yes	☐ No	**Client / Project Information**				Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?		☐ Yes	☐ No	Job #: Rankin Inlet WWTP- Monthly Effluent				
Company:				**PO / AFE:**				
Contact:				LSD:				
Address:								
Phone:		Fax:		Quote #:				
Lab Work Order # (lab use only)				**ALS Contact:** Craig Riddell	**Sampled By:** Simon Doiron			

L2447730-COFC

Sample #	Sample Identification (This description will appear on the report)	Date Sampled	Time Sampled	Sample Type	BTX,F1-F4-WP	PAH,PANH-WP	NUNAVUT-WW-GRP1-WP	F-IC-N-WP	TC,EC-QT97-WP							Number of Containers
	Rankin Inlet WWTP - Effluent			Waste	X	X	X	X	X							15
		May 13/20	May 13/20	10:00 AM												
	**NOTE TO LOGIN - remove metals Reporting Code WP-NUNAVUT-WW-GRP1															
	So all ICP-MS metals report.															
	* Sift Hg Vial arrived empty -CBL															

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Nunavut-WW-GRP1-WP pkg includes 1 L BOD/CBOD, 1 L Routine, 250 ml Metals , 40 ml Mercury Vial, 250 ml Amber Nutrient , 250 ml Amber Phenols, 2 x 250 ml Amber Oil & Grease , 250 ml Bacteria (9 bottles) + 5 Vials for BTX,F1-F4 and 1 L Amber for PAH's = Total of 15 Bottles per sample.

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 provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Bill Ross	05/ 1 20	10:00 +m	CL	May 14	1225	6.3 °C				

GENF 18.01 Front

Nunavut Community & Government Services - Rankin Inlet
ATTN: SIMON DOIRON (Rankin Inlet)
P.O. Box 490
Rankin Inlet NU X0C 0G0

Date Received: 05-JUN-20
Report Date: 22-JUN-20 15:07 (MT)
Version: FINAL

Client Phone: 867-645-8155

Certificate of Analysis

Lab Work Order #: L2456800

Project P.O. #: NOT SUBMITTED
Job Reference: RANKIN INLET WWTP - MONTHLY EFFLUENT
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2456800-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 03-JUN-20 @ 10:30							
Matrix: WASTE							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		12-JUN-20	R5117706
Toluene	<0.0010		0.0010	mg/L		12-JUN-20	R5117706
Ethyl benzene	<0.00050		0.00050	mg/L		12-JUN-20	R5117706
o-Xylene	<0.00050		0.00050	mg/L		12-JUN-20	R5117706
m+p-Xylenes	<0.00040		0.00040	mg/L		12-JUN-20	R5117706
F1 (C6-C10)	<0.10		0.10	mg/L		12-JUN-20	R5117706
Surrogate: 4-Bromofluorobenzene (SS)	87.0		70-130	%		12-JUN-20	R5117706
CCME PHC F2-F4 in Water							
F2 (C10-C16)	0.45		0.10	mg/L	12-JUN-20	13-JUN-20	R5118243
F3 (C16-C34)	5.52		0.25	mg/L	12-JUN-20	13-JUN-20	R5118243
F4 (C34-C50)	2.02		0.25	mg/L	12-JUN-20	13-JUN-20	R5118243
Surrogate: 2-Bromobenzotrifluoride	99.6		60-140	%	12-JUN-20	13-JUN-20	R5118243
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		16-JUN-20	
F2-Naphth	0.45		0.10	mg/L		16-JUN-20	
F3-PAH	5.52		0.25	mg/L		16-JUN-20	
Total Hydrocarbons (C6-C50)	8.00		0.38	mg/L		16-JUN-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		16-JUN-20	
Miscellaneous Parameters							
Fluoride (F)	0.202		0.020	mg/L		05-JUN-20	R5116727
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	>24200	PEHR	10	MPN/100mL		05-JUN-20	R5110131
Escherichia Coli	>24200	PEHR	10	MPN/100mL		05-JUN-20	R5110131
CCME PAHs in mg/L							
1-Methyl Naphthalene	0.000024		0.000020	mg/L	11-JUN-20	15-JUN-20	R5117678
2-Methyl Naphthalene	0.000030		0.000020	mg/L	11-JUN-20	15-JUN-20	R5117678
Acenaphthene	<0.000020		0.000020	mg/L	11-JUN-20	15-JUN-20	R5117678
Acenaphthylene	<0.000020		0.000020	mg/L	11-JUN-20	15-JUN-20	R5117678
Anthracene	<0.000010		0.000010	mg/L	11-JUN-20	15-JUN-20	R5117678
Acridine	<0.000020		0.000020	mg/L	11-JUN-20	15-JUN-20	R5117678
Benzo(a)anthracene	<0.000010		0.000010	mg/L	11-JUN-20	15-JUN-20	R5117678
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	11-JUN-20	15-JUN-20	R5117678
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	11-JUN-20	15-JUN-20	R5117678
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	11-JUN-20	15-JUN-20	R5117678
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	11-JUN-20	15-JUN-20	R5117678
Chrysene	<0.000020		0.000020	mg/L	11-JUN-20	15-JUN-20	R5117678
Dibenzo(a,h)anthracene	0.0000054		0.0000050	mg/L	11-JUN-20	15-JUN-20	R5117678
Fluoranthene	<0.000020		0.000020	mg/L	11-JUN-20	15-JUN-20	R5117678
Fluorene	<0.000030	DLQ	0.000030	mg/L	11-JUN-20	15-JUN-20	R5117678
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	11-JUN-20	15-JUN-20	R5117678
Naphthalene	<0.000050		0.000050	mg/L	11-JUN-20	15-JUN-20	R5117678
Phenanthrene	<0.000050		0.000050	mg/L	11-JUN-20	15-JUN-20	R5117678
Pyrene	<0.000010		0.000010	mg/L	11-JUN-20	15-JUN-20	R5117678
Quinoline	0.000055		0.000020	mg/L	11-JUN-20	15-JUN-20	R5117678
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	11-JUN-20	15-JUN-20	R5117678
Surrogate: d8-Naphthalene	105.0		50-150	%	11-JUN-20	15-JUN-20	R5117678
Surrogate: d10-Phenanthrene	102.2		50-150	%	11-JUN-20	15-JUN-20	R5117678
Surrogate: d12-Chrysene	96.2		50-150	%	11-JUN-20	15-JUN-20	R5117678
Surrogate: d10-Acenaphthene	91.6		50-150	%	11-JUN-20	15-JUN-20	R5117678
Surrogate: d9-Acridine (SS)	106.9		50-150	%	11-JUN-20	15-JUN-20	R5117678

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2456800-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 03-JUN-20 @ 10:30							
Matrix: WASTE							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	165		1.2	mg/L		12-JUN-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		12-JUN-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		12-JUN-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	135		1.0	mg/L		11-JUN-20	R5116504
Ammonia by colour							
Ammonia, Total (as N)	6.04		0.20	mg/L		12-JUN-20	R5116845
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	64		20	mg/L		06-JUN-20	R5116569
Carbonaceous BOD							
BOD Carbonaceous	53		20	mg/L		06-JUN-20	R5116569
Chloride in Water by IC							
Chloride (Cl)	85.1		0.50	mg/L		05-JUN-20	R5116727
Conductivity							
Conductivity	620		1.0	umhos/cm		11-JUN-20	R5116504
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	>24200	PEHR	10	MPN/100mL		05-JUN-20	R5110129
Hardness Calculated							
Hardness (as CaCO3)	124	HTC	0.20	mg/L		22-JUN-20	
Mercury Total							
Mercury (Hg)-Total	0.0000110		0.0000050	mg/L	15-JUN-20	15-JUN-20	R5117839
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		05-JUN-20	R5116727
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		12-JUN-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		05-JUN-20	R5116727
Oil & Grease - Gravimetric							
Oil and Grease	9.1		5.0	mg/L		11-JUN-20	R5119256
Phenol (4AAP)							
Phenols (4AAP)	0.0081		0.0010	mg/L		11-JUN-20	R5116675
Phosphorus, Total							
Phosphorus (P)-Total	1.99		0.030	mg/L		10-JUN-20	R5114720
Sulfate in Water by IC							
Sulfate (SO4)	40.3		0.30	mg/L		05-JUN-20	R5116727
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.160		0.0030	mg/L	19-JUN-20	19-JUN-20	R5127170
Antimony (Sb)-Total	0.00017		0.00010	mg/L	19-JUN-20	19-JUN-20	R5127170
Arsenic (As)-Total	0.00125		0.00010	mg/L	19-JUN-20	19-JUN-20	R5127170
Barium (Ba)-Total	0.0393		0.00010	mg/L	19-JUN-20	19-JUN-20	R5127170
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	19-JUN-20	19-JUN-20	R5127170
Bismuth (Bi)-Total	0.00170		0.000050	mg/L	19-JUN-20	19-JUN-20	R5127170
Boron (B)-Total	0.077		0.010	mg/L	19-JUN-20	19-JUN-20	R5127170
Cadmium (Cd)-Total	0.0000556		0.0000050	mg/L	19-JUN-20	19-JUN-20	R5127170
Calcium (Ca)-Total	35.2		0.050	mg/L	19-JUN-20	19-JUN-20	R5127170
Cesium (Cs)-Total	0.000089		0.000010	mg/L	19-JUN-20	19-JUN-20	R5127170
Chromium (Cr)-Total	0.00233		0.00010	mg/L	19-JUN-20	19-JUN-20	R5127170
Cobalt (Co)-Total	0.00025		0.00010	mg/L	19-JUN-20	19-JUN-20	R5127170
Copper (Cu)-Total	0.170		0.00050	mg/L	19-JUN-20	19-JUN-20	R5127170

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2456800-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 03-JUN-20 @ 10:30							
Matrix: WASTE							
Total Metals in Water by CRC ICPMS							
Iron (Fe)-Total	0.366		0.010	mg/L	19-JUN-20	19-JUN-20	R5127170
Lead (Pb)-Total	0.000780		0.000050	mg/L	19-JUN-20	19-JUN-20	R5127170
Lithium (Li)-Total	0.0036		0.0010	mg/L	19-JUN-20	19-JUN-20	R5127170
Magnesium (Mg)-Total	8.80		0.0050	mg/L	19-JUN-20	19-JUN-20	R5127170
Manganese (Mn)-Total	0.0286		0.00010	mg/L	19-JUN-20	19-JUN-20	R5127170
Molybdenum (Mo)-Total	0.00107		0.000050	mg/L	19-JUN-20	19-JUN-20	R5127170
Nickel (Ni)-Total	0.00604		0.00050	mg/L	19-JUN-20	19-JUN-20	R5127170
Potassium (K)-Total	8.30		0.050	mg/L	19-JUN-20	19-JUN-20	R5127170
Phosphorus (P)-Total	2.20		0.030	mg/L	19-JUN-20	19-JUN-20	R5127170
Rubidium (Rb)-Total	0.00906		0.00020	mg/L	19-JUN-20	19-JUN-20	R5127170
Selenium (Se)-Total	0.000152		0.000050	mg/L	19-JUN-20	19-JUN-20	R5127170
Silicon (Si)-Total	0.47		0.10	mg/L	19-JUN-20	19-JUN-20	R5127170
Silver (Ag)-Total	0.000023		0.000010	mg/L	19-JUN-20	19-JUN-20	R5127170
Sodium (Na)-Total	46.0		0.050	mg/L	19-JUN-20	19-JUN-20	R5127170
Strontium (Sr)-Total	0.173		0.00020	mg/L	19-JUN-20	19-JUN-20	R5127170
Sulfur (S)-Total	14.1		0.50	mg/L	19-JUN-20	19-JUN-20	R5127170
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	19-JUN-20	19-JUN-20	R5127170
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	19-JUN-20	19-JUN-20	R5127170
Thorium (Th)-Total	<0.00010		0.00010	mg/L	19-JUN-20	19-JUN-20	R5127170
Tin (Sn)-Total	0.00044		0.00010	mg/L	19-JUN-20	19-JUN-20	R5127170
Titanium (Ti)-Total	0.00442		0.00030	mg/L	19-JUN-20	19-JUN-20	R5127170
Tungsten (W)-Total	<0.00010		0.00010	mg/L	19-JUN-20	19-JUN-20	R5127170
Uranium (U)-Total	0.000157		0.000010	mg/L	19-JUN-20	19-JUN-20	R5127170
Vanadium (V)-Total	<0.00050		0.00050	mg/L	19-JUN-20	19-JUN-20	R5127170
Zinc (Zn)-Total	0.0712		0.0030	mg/L	19-JUN-20	19-JUN-20	R5127170
Zirconium (Zr)-Total	0.00045		0.00020	mg/L	19-JUN-20	19-JUN-20	R5127170
Total Organic Carbon by Combustion							
Total Organic Carbon	51.5		0.50	mg/L		10-JUN-20	R5115889
Total Suspended Solids							
Total Suspended Solids	54.3		3.0	mg/L		10-JUN-20	R5117746
pH							
pH	7.45		0.10	pH units		11-JUN-20	R5116504

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLQ	Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.
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.
PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-CO3CO3-CALC-WP	Water	Alkalinity, Carbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by carbonate is calculated and reported as mg CO3 2-/L.

ALK-HCO3HCO3-CALC-WP	Water	Alkalinity, Bicarbonate	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by bicarbonate is calculated and reported as mg HCO3-/L

ALK-OHOH-CALC-WP	Water	Alkalinity, Hydroxide	CALCULATION

The Alkalinity of water is a measure of its acid neutralizing capacity.Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. The fraction of alkalinity contributed by hydroxide is calculated and reported as mg OH-/L.

ALK-TITR-WP	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

The Alkalinity of water is a measure of its acid neutralizing capacity. Alkalinity is imparted by bicarbonate, carbonate and hydroxide components of water. Total alkalinity is determined by titration with a strong standard mineral acid to the successive HCO3- and H2CO3 endpoints indicated electrometrically.

BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B

Samples are diluted and seeded, have TCMP added to inhibit nitrogenous demands, and then are incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.

BOD-WP	Water	Biochemical Oxygen Demand (BOD)	APHA 5210 B

Samples are diluted and seeded and then incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO.

BTEXS+F1-HSMS-WP	Water	BTX plus F1 by GCMS	EPA 8260C / EPA 5021A

The water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transfered into a gas chromatograph. Target compound concentrations are measured using mass spectrometry detection.

C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP

Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.

CL-IC-N-WP	Water	Chloride in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

EC-SCREEN-WP	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Qualitative analysis of conductivity where required during preparation of other test eg. IC, TDS, TSS, etc

EC-WP	Water	Conductivity	APHA 2510B

Conductivity of an aqueous solution refers to its ability to carry an electric current. Conductance of a solution is measured between two spatially fixed and chemically inert electrodes.

F-IC-N-WP	Water	Fluoride in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

F1-F4-CALC-WP	Water	CCME Total Hydrocarbons	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F2-F4-FID-WP	Water	CCME PHC F2-F4 in Water	EPA 3511

Petroleum hydrocarbons in water are determined by liquid-liquid micro-scale solvent extraction using a reciprocal shaker extraction apparatus prior to capillary column gas chromatography with flame ionization detection (GC-FID) analysis.

FC10-QT97-WP	Water	Fecal coliforms, 1:10 dilution by QT97	APHA 9223B QT97

Analysis is carried out using procedures adapted from APHA 9223 "Enzyme Substrate Coliform Test". Fecal (thermotolerant) coliform bacteria are determined by mixing a 1:10 dilution of sample with a product containing hydrolyzable substrates and sealing in a 97-well packet. The packet is incubated at 44.5 +/- 0.2 degrees C for 18 hours and then the number of wells exhibiting positive responses are counted. The final results are obtained by comparing the number of positive responses to a probability table.

HARDNESS-CALC-WP	Water	Hardness Calculated	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-WP	Water	Mercury Total	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WP	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020B (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.

NH3-COL-WP	Water	Ammonia by colour	APHA 4500 NH3 F

Ammonia in water samples forms indophenol when reacted with hypochlorite and phenol. The intensity is amplified by the addition of sodium nitroprusside and measured colourmetrically.

NO2+NO3-CALC-WP	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-WP	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

OG-GRAV-WP	Water	Oil & Grease - Gravimetric	EPA 1664 (modified)

Water samples are acidified and extracted with hexane; the hexane extract is collected in a pre-weighed vial. The solvent is evaporated and Total Oil & Grease is determined from the weight of the residue in the vial.

P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS-L

This analysis is carried out using procedures adapted from APHA METHOD 4500-P "Phosphorus". Total Phosphorus is determined colourmetrically after persulphate digestion of the sample.

PAH-CCME-PPM-WT	Water	CCME PAHs in mg/L	EPA 3511/8270D (mod)

PAHs are extracted from water using a hexane micro-extraction technique, with analysis by GC/MS. Because the two isomers cannot be readily separated chromatographically, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.

PH-WP	Water	pH	APHA 4500H

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			
SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			
TC,EC10-QT97-WP	Water	Total and E. coli, 1:10 dilution by QT97	APHA 9223B QT97
Analysis is carried out using procedures adapted from APHA 9223 "Enzyme Susbtrate Coliform Test". Total coliforms and Escherichia coli bacteria are simultaneously determined by mixing a 1:10 dilution of sample with a product containing hydrolyzable substrates and sealing in a 97-well packet. The packet is incubated at 35.0 +/- 0.5 degrees C for 18 or 24 hours and then the number of wells exhibiting positive responses are counted. The final results are obtained by comparing the number of positive responses to a probability table.			
XYLENES-SUM-CALC-WP	Water	Sum of Xylene Isomer Concentrations	CALCULATED RESULT
Total xylenes represents the sum of o-xylene and m&p-xylene.			

** 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
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

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.

Quality Control Report

Client: Nunavut Community & Government Services - Rankin Inlet
P.O. Box 490
Rankin Inlet NU X0C 0G0
Contact: SIMON DOIRON (Rankin Inlet)

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-WP	**Water**							
Batch R5116504								
WG3340892-9 LCS								
Alkalinity, Total (as CaCO3)			103.5		%		85-115	11-JUN-20
WG3340892-6 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	11-JUN-20
BOD-CBOD-WP	**Water**							
Batch R5116569								
WG3336709-2 LCS								
BOD Carbonaceous			104.9		%		85-115	06-JUN-20
WG3336709-1 MB								
BOD Carbonaceous			<2.0		mg/L		2	06-JUN-20
BOD-WP	**Water**							
Batch R5116569								
WG3336709-2 LCS								
Biochemical Oxygen Demand			101.1		%		85-115	06-JUN-20
WG3336709-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	06-JUN-20
BTEXS+F1-HSMS-WP	**Water**							
Batch R5117706								
WG3341334-4 DUP		**L2456800-1**						
Benzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	12-JUN-20
Toluene		<0.0010	<0.0010	RPD-NA	mg/L	N/A	30	12-JUN-20
Ethyl benzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	12-JUN-20
o-Xylene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	12-JUN-20
m+p-Xylenes		<0.00040	<0.00040	RPD-NA	mg/L	N/A	30	12-JUN-20
F1 (C6-C10)		<0.10	<0.10	RPD-NA	mg/L	N/A	30	12-JUN-20
WG3341334-2 LCS								
Benzene			97.8		%		70-130	12-JUN-20
Toluene			91.4		%		70-130	12-JUN-20
Ethyl benzene			99.5		%		70-130	12-JUN-20
o-Xylene			118.0		%		70-130	12-JUN-20
m+p-Xylenes			111.0		%		70-130	12-JUN-20
WG3341334-3 LCS								
F1 (C6-C10)			104.9		%		70-130	12-JUN-20
WG3341334-1 MB								
Benzene			<0.00050		mg/L		0.0005	12-JUN-20
Toluene			<0.0010		mg/L		0.001	12-JUN-20
Ethyl benzene			<0.00050		mg/L		0.0005	12-JUN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTEXS+F1-HSMS-WP	**Water**							
Batch R5117706								
WG3341334-1 MB								
o-Xylene			<0.00050		mg/L		0.0005	12-JUN-20
m+p-Xylenes			<0.00040		mg/L		0.0004	12-JUN-20
F1 (C6-C10)			<0.10		mg/L		0.1	12-JUN-20
Surrogate: 4-Bromofluorobenzene (SS)			84.0		%		70-130	12-JUN-20
C-TOC-HTC-WP	**Water**							
Batch R5115889								
WG3340194-2 LCS								
Total Organic Carbon			102.5		%		80-120	10-JUN-20
WG3340194-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	10-JUN-20
CL-IC-N-WP	**Water**							
Batch R5116727								
WG3336576-14 LCS								
Chloride (Cl)			101.2		%		90-110	05-JUN-20
WG3336576-13 MB								
Chloride (Cl)			<0.50		mg/L		0.5	05-JUN-20
EC-WP	**Water**							
Batch R5116504								
WG3340892-8 LCS								
Conductivity			100.9		%		90-110	11-JUN-20
WG3340892-6 MB								
Conductivity			<1.0		umhos/cm		1	11-JUN-20
F-IC-N-WP	**Water**							
Batch R5116727								
WG3336576-14 LCS								
Fluoride (F)			101.8		%		90-110	05-JUN-20
WG3336576-13 MB								
Fluoride (F)			<0.020		mg/L		0.02	05-JUN-20
F2-F4-FID-WP	**Water**							
Batch R5118243								
WG3341079-2 LCS								
F2 (C10-C16)			96.5		%		70-130	12-JUN-20
F3 (C16-C34)			91.6		%		70-130	12-JUN-20
F4 (C34-C50)			98.2		%		70-130	12-JUN-20
WG3341079-1 MB								
F2 (C10-C16)			<0.10		mg/L		0.1	12-JUN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-FID-WP	**Water**							
Batch R5118243								
WG3341079-1 MB								
F3 (C16-C34)			<0.25		mg/L		0.25	12-JUN-20
F4 (C34-C50)			<0.25		mg/L		0.25	12-JUN-20
Surrogate: 2-Bromobenzotrifluoride			97.0		%		60-140	12-JUN-20
FC10-QT97-WP	**Water**							
Batch R5110129								
WG3336301-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	05-JUN-20
HG-T-CVAA-WP	**Water**							
Batch R5117839								
WG3342354-2 LCS								
Mercury (Hg)-Total			95.0		%		80-120	15-JUN-20
WG3342354-1 MB								
Mercury (Hg)-Total			<0.000005(		mg/L		0.000005	15-JUN-20
MET-T-CCMS-WP	**Water**							
Batch R5127170								
WG3345349-2 LCS								
Aluminum (Al)-Total			99.5		%		80-120	19-JUN-20
Antimony (Sb)-Total			111.3		%		80-120	19-JUN-20
Arsenic (As)-Total			99.8		%		80-120	19-JUN-20
Barium (Ba)-Total			104.1		%		80-120	19-JUN-20
Beryllium (Be)-Total			100.9		%		80-120	19-JUN-20
Bismuth (Bi)-Total			110.6		%		80-120	19-JUN-20
Boron (B)-Total			96.6		%		80-120	19-JUN-20
Cadmium (Cd)-Total			103.0		%		80-120	19-JUN-20
Calcium (Ca)-Total			105.3		%		80-120	19-JUN-20
Cesium (Cs)-Total			112.9		%		80-120	19-JUN-20
Chromium (Cr)-Total			101.1		%		80-120	19-JUN-20
Cobalt (Co)-Total			99.96		%		80-120	19-JUN-20
Copper (Cu)-Total			99.1		%		80-120	19-JUN-20
Iron (Fe)-Total			94.8		%		80-120	19-JUN-20
Lead (Pb)-Total			110.6		%		80-120	19-JUN-20
Lithium (Li)-Total			98.9		%		80-120	19-JUN-20
Magnesium (Mg)-Total			102.7		%		80-120	19-JUN-20
Manganese (Mn)-Total			99.6		%		80-120	19-JUN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R5127170								
WG3345349-2 LCS								
Molybdenum (Mo)-Total			106.6		%		80-120	19-JUN-20
Nickel (Ni)-Total			98.8		%		80-120	19-JUN-20
Potassium (K)-Total			99.1		%		80-120	19-JUN-20
Phosphorus (P)-Total			98.3		%		80-120	19-JUN-20
Rubidium (Rb)-Total			101.2		%		80-120	19-JUN-20
Selenium (Se)-Total			103.2		%		80-120	19-JUN-20
Silicon (Si)-Total			98.5		%		80-120	19-JUN-20
Silver (Ag)-Total			113.0		%		80-120	19-JUN-20
Sodium (Na)-Total			104.5		%		80-120	19-JUN-20
Strontium (Sr)-Total			109.3		%		80-120	19-JUN-20
Sulfur (S)-Total			99.5		%		80-120	19-JUN-20
Tellurium (Te)-Total			105.9		%		80-120	19-JUN-20
Thallium (Tl)-Total			109.9		%		80-120	19-JUN-20
Thorium (Th)-Total			112.0		%		80-120	19-JUN-20
Tin (Sn)-Total			101.5		%		80-120	19-JUN-20
Titanium (Ti)-Total			95.3		%		80-120	19-JUN-20
Tungsten (W)-Total			109.7		%		80-120	19-JUN-20
Uranium (U)-Total			107.2		%		80-120	19-JUN-20
Vanadium (V)-Total			99.3		%		80-120	19-JUN-20
Zinc (Zn)-Total			101.3		%		80-120	19-JUN-20
Zirconium (Zr)-Total			104.9		%		80-120	19-JUN-20
WG3345349-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	19-JUN-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	19-JUN-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	19-JUN-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	19-JUN-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	19-JUN-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	19-JUN-20
Boron (B)-Total			<0.010		mg/L		0.01	19-JUN-20
Cadmium (Cd)-Total			<0.000005(		mg/L		0.000005	19-JUN-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	19-JUN-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	19-JUN-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	19-JUN-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	19-JUN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	**Water**							
Batch R5127170								
WG3345349-1 MB								
Copper (Cu)-Total			<0.00050		mg/L		0.0005	19-JUN-20
Iron (Fe)-Total			<0.010		mg/L		0.01	19-JUN-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	19-JUN-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	19-JUN-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	19-JUN-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	19-JUN-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	19-JUN-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	19-JUN-20
Potassium (K)-Total			<0.050		mg/L		0.05	19-JUN-20
Phosphorus (P)-Total			<0.030		mg/L		0.03	19-JUN-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	19-JUN-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	19-JUN-20
Silicon (Si)-Total			<0.10		mg/L		0.1	19-JUN-20
Silver (Ag)-Total			<0.000010		mg/L		0.00001	19-JUN-20
Sodium (Na)-Total			<0.050		mg/L		0.05	19-JUN-20
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	19-JUN-20
Sulfur (S)-Total			<0.50		mg/L		0.5	19-JUN-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	19-JUN-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	19-JUN-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	19-JUN-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	19-JUN-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	19-JUN-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	19-JUN-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	19-JUN-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	19-JUN-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	19-JUN-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	19-JUN-20
NH3-COL-WP	**Water**							
Batch R5116845								
WG3341237-18 LCS								
Ammonia, Total (as N)			103.6		%		85-115	12-JUN-20
WG3341237-17 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	12-JUN-20
NO2-IC-N-WP	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-WP	**Water**							
Batch R5116727								
WG3336576-14 LCS								
Nitrite (as N)			100.2		%		90-110	05-JUN-20
WG3336576-13 MB								
Nitrite (as N)			<0.010		mg/L		0.01	05-JUN-20
NO3-IC-N-WP	**Water**							
Batch R5116727								
WG3336576-14 LCS								
Nitrate (as N)			101.8		%		90-110	05-JUN-20
WG3336576-13 MB								
Nitrate (as N)			<0.020		mg/L		0.02	05-JUN-20
OG-GRAV-WP	**Water**							
Batch R5119256								
WG3342077-2 LCS								
Oil and Grease			114.9		%		70-130	11-JUN-20
WG3342077-1 MB								
Oil and Grease			<5.0		mg/L		5	11-JUN-20
P-T-COL-WP	**Water**							
Batch R5114720								
WG3338699-18 LCS								
Phosphorus (P)-Total			97.2		%		80-120	10-JUN-20
WG3338699-17 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	10-JUN-20
PAH-CCME-PPM-WT	**Water**							
Batch R5117678								
WG3339825-2 LCS								
1-Methyl Naphthalene			103.3		%		50-150	15-JUN-20
2-Methyl Naphthalene			101.3		%		50-150	15-JUN-20
Acenaphthene			112.0		%		50-150	15-JUN-20
Acenaphthylene			114.4		%		50-150	15-JUN-20
Anthracene			119.3		%		50-150	15-JUN-20
Acridine			109.3		%		50-150	15-JUN-20
Benzo(a)anthracene			115.3		%		50-150	15-JUN-20
Benzo(a)pyrene			111.9		%		50-150	15-JUN-20
Benzo(b&j)fluoranthene			108.3		%		50-150	15-JUN-20
Benzo(g,h,i)perylene			117.9		%		50-150	15-JUN-20
Benzo(k)fluoranthene			112.3		%		50-150	15-JUN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-CCME-PPM-WT	**Water**							
Batch R5117678								
WG3339825-2 LCS								
Chrysene			114.6		%		50-150	15-JUN-20
Dibenzo(a,h)anthracene			115.4		%		50-150	15-JUN-20
Fluoranthene			124.3		%		50-150	15-JUN-20
Fluorene			117.3		%		50-150	15-JUN-20
Indeno(1,2,3-cd)pyrene			128.6		%		50-150	15-JUN-20
Naphthalene			146.3		%		50-150	15-JUN-20
Phenanthrene			123.8		%		50-150	15-JUN-20
Pyrene			122.8		%		50-150	15-JUN-20
Quinoline			116.8		%		50-150	15-JUN-20
WG3339825-1 MB								
1-Methyl Naphthalene			<0.000020		mg/L		0.00002	15-JUN-20
2-Methyl Naphthalene			<0.000020		mg/L		0.00002	15-JUN-20
Acenaphthene			<0.000020		mg/L		0.00002	15-JUN-20
Acenaphthylene			<0.000020		mg/L		0.00002	15-JUN-20
Anthracene			<0.000010		mg/L		0.00001	15-JUN-20
Acridine			<0.000020		mg/L		0.00002	15-JUN-20
Benzo(a)anthracene			<0.000010		mg/L		0.00001	15-JUN-20
Benzo(a)pyrene			<0.000005		mg/L		0.000005	15-JUN-20
Benzo(b&j)fluoranthene			<0.000010		mg/L		0.00001	15-JUN-20
Benzo(g,h,i)perylene			<0.000020		mg/L		0.00002	15-JUN-20
Benzo(k)fluoranthene			<0.000010		mg/L		0.00001	15-JUN-20
Chrysene			<0.000020		mg/L		0.00002	15-JUN-20
Dibenzo(a,h)anthracene			<0.000005		mg/L		0.000005	15-JUN-20
Fluoranthene			<0.000020		mg/L		0.00002	15-JUN-20
Fluorene			<0.000020		mg/L		0.00002	15-JUN-20
Indeno(1,2,3-cd)pyrene			<0.000010		mg/L		0.00001	15-JUN-20
Naphthalene			<0.000050		mg/L		0.00005	15-JUN-20
Phenanthrene			<0.000050		mg/L		0.00005	15-JUN-20
Pyrene			<0.000010		mg/L		0.00001	15-JUN-20
Quinoline			<0.000020		mg/L		0.00002	15-JUN-20
Surrogate: d8-Naphthalene			138.2		%		50-150	15-JUN-20
Surrogate: d10-Phenanthrene			97.6		%		50-150	15-JUN-20
Surrogate: d12-Chrysene			86.8		%		50-150	15-JUN-20
Surrogate: d10-Acenaphthene			94.3		%		50-150	15-JUN-20

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-CCME-PPM-WT	**Water**							
Batch R5117678								
WG3339825-1 MB								
Surrogate: d9-Acridine (SS)			82.4		%		50-150	15-JUN-20
PH-WP	**Water**							
Batch R5116504								
WG3340892-7 LCS								
pH			7.37		pH units		7.3-7.5	11-JUN-20
PHENOLS-4AAP-WT	**Water**							
Batch R5116675								
WG3340177-2 LCS								
Phenols (4AAP)			109.1		%		85-115	11-JUN-20
WG3340177-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	11-JUN-20
SO4-IC-N-WP	**Water**							
Batch R5116727								
WG3336576-14 LCS								
Sulfate (SO4)			102.6		%		90-110	05-JUN-20
WG3336576-13 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	05-JUN-20
SOLIDS-TOTSUS-WP	**Water**							
Batch R5117746								
WG3338622-8 LCS								
Total Suspended Solids			96.2		%		85-115	10-JUN-20
WG3338622-7 MB								
Total Suspended Solids			<3.0		mg/L		3	10-JUN-20
TC,EC10-QT97-WP	**Water**							
Batch R5110131								
WG3336305-2 DUP		**L2456800-1**						
Total Coliforms		>24200	>24200		MPN/100mL	0.0	65	05-JUN-20
Escherichia Coli		>24200	>24200		MPN/100mL	0.0	65	05-JUN-20
WG3336305-1 MB								
Total Coliforms			<1		MPN/100mL		1	05-JUN-20
Escherichia Coli			<1		MPN/100mL		1	05-JUN-20

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							
pH							
	1	03-JUN-20 10:30	11-JUN-20 12:00	0.25	193	hours	EHTR-FM
Bacteriological Tests							
Fecal coliforms, 1:10 dilution by QT97							
	1	03-JUN-20 10:30	05-JUN-20 14:20	30	52	hours	EHTR
Total and E. coli, 1:10 dilution by QT97							
	1	03-JUN-20 10:30	05-JUN-20 14:40	30	52	hours	EHTR
Aggregate Organics							
Biochemical Oxygen Demand (BOD)							
	1	03-JUN-20 10:30	06-JUN-20 07:00	48	68	hours	EHTR
Carbonaceous BOD							
	1	03-JUN-20 10:30	06-JUN-20 07:00	48	68	hours	EHTR

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 L2456800 were received on 05-JUN-20 11:30.

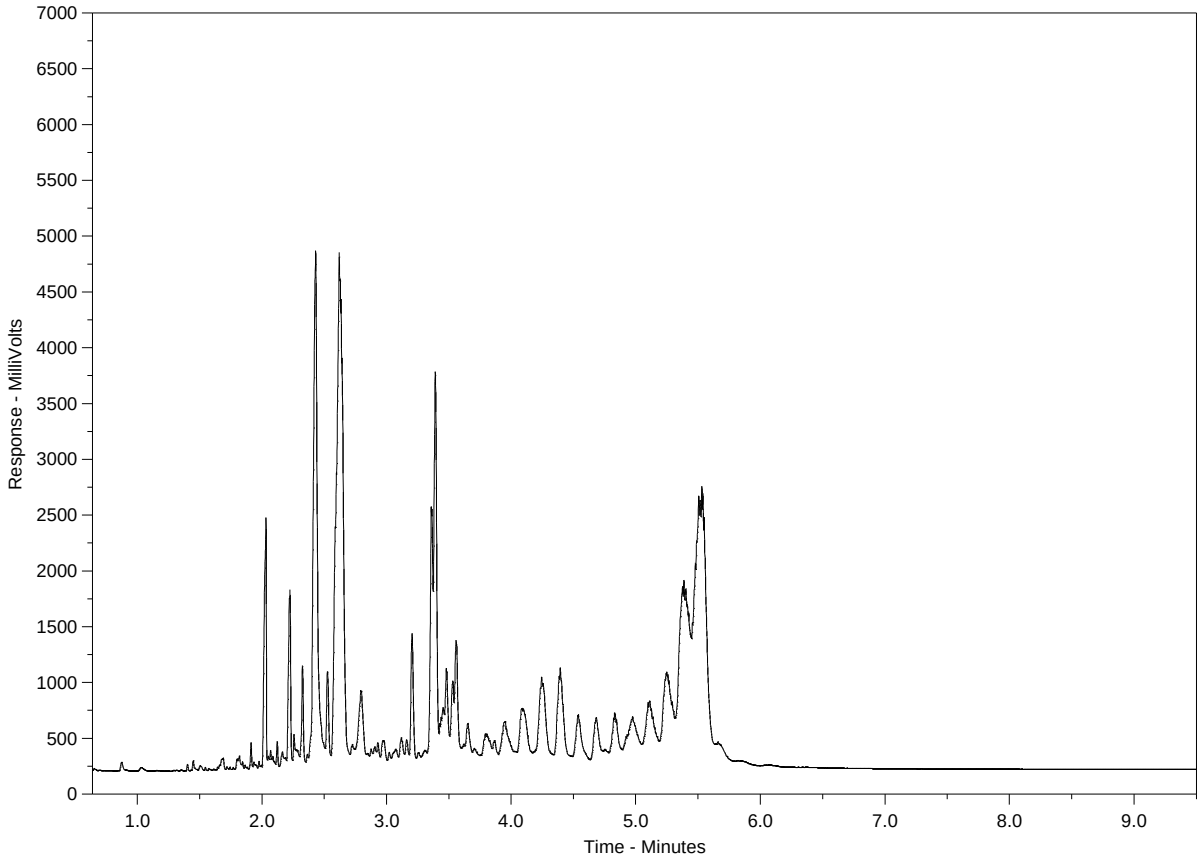
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where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

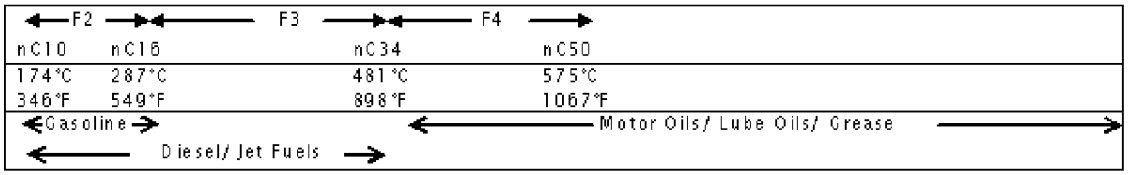
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L2456800-1
Client Sample ID: RANKIN INLET WWTP - EFFLUENT





The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR library can be found at www.alsglobal.com.

ALS Environmental

L2456800-COFC

COC # _____

Page ____ of ____

Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)
Company:	Nunavut CGS - Rankin Inlet (W8133)	☑ Standard ☐ Other		◉ Regular (Standard Turnaround Times - Business Days)
Contact:	SIMON DOIRON	☑ PDF ☐ Excel ☐ Digital ☐ Fax		○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	Box 490	Email 1: sdoiron@gov.nu.ca		○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	Rankin Inlet , NU, X0C 0G0	Email 2: mlusty@gov.nu.ca		○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	867-645-8155 Cell# :	Email 3:		Analysis Request
Invoice To	Same as Report ? ☑ Yes ☐ No	Client / Project Information		Please indicate below Filtered, Preserved or both (F, P, F/P)
Hardcopy of Invoice with Report?	☐ Yes ☐ No	Job #:	Rankin Inlet WWTP- Monthly Effluent	
Company:		PO / AFE:		
Contact:		LSD:		
Address:				
Phone:	Fax:	Quote #:		
Lab Work Order # (lab use only)		ALS Contact:	Craig Riddell	Sampled By: Simon Doiron

Sample #	Sample Identification (This description will appear on the report)	Date Sampled	Time Sampled	Sample Type	BTX,F1-F4-WP	PAH,PANH-WP	NUNAVUT-WW-GRP1-WP	F-IC-N-WP	TC,EC-QT97-WP								Number of Containers
	Rankin Inlet WWTP - Effluent	06/03/20	10:30 Am	Waste	x	x	x	x	x								15
	**NOTE TO LOGIN - remove metals Reporting Code WP-NUNAVUT-WW-GRP1																
	So all ICP-MS metals report.																

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Nunavut-WW-GRP1-WP pkg includes 1 L BOD/CBOD, 1 L Routine, 250 ml Metals , 40 ml Mercury Vial, 250 ml Amber Nutrient , 250 ml Amber Phenols, 2 x 250 ml Amber Oil & Grease , 250 ml Bacteria (9 bottles) + 5 Vials for BTX,F1-F4 and 1 L Amber for PAH's = Total of 15 Bottles per sample.

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 provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh:mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Bill Ross	06/03/20	10:30 Am	AL	5 June	1130	15.5 °C				

GENF 18.01 Front

Appendix B: Daily Record of Nipissar Lake Volumes GRA-1

Raw Water Supply From Nipissar Lake

Water Licence No. 3AM-GRA1624

GRA-1

Date	Volume (m^3)	Daily Volume (m^3)	Total Volume (m^3)	Total Monthly Volume (m^3)
01-Apr-20				
02-Apr-20				
03-Apr-20				
04-Apr-20				
05-Apr-20				
06-Apr-20				
07-Apr-20				
08-Apr-20				
09-Apr-20				
10-Apr-20				
11-Apr-20				
12-Apr-20				
13-Apr-20				
14-Apr-20				
15-Apr-20				
16-Apr-20				
17-Apr-20				
18-Apr-20				
19-Apr-20				
20-Apr-20				
21-Apr-20				
22-Apr-20				
23-Apr-20				
24-Apr-20				
25-Apr-20				
26-Apr-20				
27-Apr-20				
28-Apr-20				
29-Apr-20				**0.00**
30-Apr-20				
01-May-20				
02-May-20				
03-May-20				
04-May-20				
05-May-20				
06-May-20				
07-May-20				
08-May-20				
09-May-20				
10-May-20				
11-May-20				
12-May-20				
13-May-20				
14-May-20				
15-May-20				
16-May-20				
17-May-20				
18-May-20				
19-May-20				
20-May-20				
21-May-20				
22-May-20				
23-May-20				
24-May-20				
25-May-20				
26-May-20				
27-May-20				
28-May-20				
29-May-20				
30-May-20				**0.00**
31-May-20				
01-Jun-20				
02-Jun-20				
03-Jun-20				
04-Jun-20	4,773,495.00	190,740.00	4,770,810.00	
05-Jun-20	4,775,856.00	2,361.00	4,773,171.00	
06-Jun-20	4,780,595.74	4,739.74	4,777,910.74	
07-Jun-20	4,785,705.26	5,109.52	4,783,020.26	
08-Jun-20	4,787,748.00	2,042.74	4,785,063.00	
09-Jun-20	4,790,232.00	2,484.00	4,787,547.00	
10-Jun-20	4,792,810.00	2,578.00	4,790,125.00	
11-Jun-20	4,795,676.00	2,866.00	4,792,991.00	
12-Jun-20	4,798,309.00	2,633.00	4,795,624.00	
13-Jun-20	4,800,219.00	1,910.00	4,797,534.00	
14-Jun-20	4,801,937.00	1,718.00	4,799,252.00	
15-Jun-20	4,804,278.00	2,341.00	4,801,593.00	
16-Jun-20	4,806,393.00	2,115.00	4,803,708.00	
17-Jun-20	4,808,474.00	2,081.00	4,805,789.00	
18-Jun-20	4,810,618.00	2,144.00	4,807,933.00	
19-Jun-20	4,812,772.00	2,154.00	4,810,087.00	
20-Jun-20	4,814,757.00	1,985.00	4,812,072.00	
21-Jun-20	4,816,764.00	2,007.00	4,814,079.00	
22-Jun-20	4,819,016.00	2,252.00	4,816,331.00	
23-Jun-20	4,821,384.00	2,368.00	4,818,699.00	
24-Jun-20	4,823,439.00	2,055.00	4,820,754.00	
25-Jun-20	4,825,565.00	2,126.00	4,822,880.00	
26-Jun-20	4,827,477.09	1,912.09	4,824,792.09	
27-Jun-20		-4,827,477.09	-2,685.00	
28-Jun-20		0.00	-2,685.00	
29-Jun-20		0.00	-2,685.00	**53,982.09**
30-Jun-20		0.00	-2,685.00	