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ANNUAL REPORT FOR GN-CGS RANKIN INLET

YEAR BEING REPORTED: 2020

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water License 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;**
- b) Monthly quantities of fresh Water obtained from all sources;**

Attached are results for Monitoring Station GRA-1 and GRA-3, as well as detailed chemical, physical and biological analysis required at GRA-2, GRA-6 and GRA-7.

Month Reported	Quantity of Water Obtained from all Sources (m³)	Quantity of Sewage Waste Discharged (Estimated, m³)
January	21,739*	Same
February	56,571	Same
March	25,571*	Same
April	0*	Same
May	0*	Same
June	53,982	Same
July	58,199	49,554
August	58,206	52,534
September	54,891	56,483
October	57,251	Same
November	57,497	Same
December	65,547	Same
ANNUAL TOTAL	776,956*	Same*

*Broken flow meters and missed readings have caused monthly totals to become incomplete and inaccurate. The Annual Total was provided by tracking totals on the flow meters in use.

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c) The monthly and annual quantities of wastes removed for disposal from Licensed Facilities;

Month Reported	Solids Removed from the Sewage Treatment Facility (m ³)
January	4
February	4
March	4
April	4
May	4
June	4
July	4
August	4
September	4
October	4
November	4
December	4
ANNUAL TOTAL	48

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

Below are the Lower Landing Lake pumping volumes from July 6th to September 21st.

Month Reported	Water Transferred from Lower Landing Lake to Nipissar Lake (m ³)
July	118,481
August	141,266
September	95,696
TOTAL	355,444

A total of 355,444 m³ was pumped to Nipissar Lake in 2020. A flowmeter was installed on July 22nd and lost power on September 18th that measured 245,444 m³. Approximately 110,000 m³ was not registered through the meter from July 6th-21st and September 18th-21st. Pumping was for a total of 78 days. The monthly totals are estimates calculated from the total value.

Below are the results for Monitoring Program Station GRA-1. The water level in Nipissar Lake increased by 193 cm from July 3rd, 2020 to September 21st, 2020. Please note, water elevation is a measurement taken from a datum on the shoreline; therefore, a decrease in elevation measurement represents an increase in Lake water level.

Month Reported	Nipissar Lake Elevation (m)	Change in Nipissar Lake Elevation (m)
July	2.76	-
August	2.71	0.05
September	2.53	0.18

e) A summary of modifications and/or major maintenance work carried out on the Water Supply and Sewage Treatment Facilities, including all associated structures and facilities;

- None

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f) A list of unauthorized discharges and summary of follow-up actions taken;

Spill No.	Date	Site Description	Commodity	Quantity (L)
2020103	04/17/20	Maani Ulujuk Ilinniavik	Petroleum-fuel oil (jet A, diesel, turbo A, heat)	18,400.00
2020186	05/19/20	21-21 Titiganiaq Street	Petroleum-fuel oil (jet A, diesel, turbo A, heat)	200.00
2020183	06/16/20	209-69 Pukkinniq (69th) Street	Petroleum-fuel oil (jet A, diesel, turbo A, heat)	20.00
2020320	09/06/20	Rankin Inlet Housing Asso. PO Box 160 Rankin Inlet	Petroleum-fuel oil (jet A, diesel, turbo A, heat)	302.00
2020372	10/01/20	N/A	Petroleum-fuel oil (jet A, diesel, turbo A, heat)	75.00
2020414	10/22/20	Lot 2, plan 603 Rankin Inlet	Petroleum-waste oil (slops, sludge)	150.00
2020434	11/01/20	Rankin Inlet – Calm Air Airport	Chemicals (including transformer oils)	Unknown
202440	11/17/20	Meladine Gold Project	Petroleum-fuel oil (jet A, diesel, turbo A, heat)	Unknown

g) Any revisions to approved Plans and Manuals as required by Part B, Item 11, submitted in the form of an Addendum;

- Updated Environmental Monitoring and Quality Assurance and Quality Control and Environmental Contingency and Monitoring Plan are submitted along with the enclosed Annual Report.
- An updated Pumping Plan for the annual resupply from Lower Landing Lake is under development and will be submitted when complete.

h) A summary of abandonment and restoration work completed during the year and an outline of any work anticipated for the next year;

- None

i) A summary of any studies, reports and plans requested by the Board that relate to waste disposal, Water use or reclamation, and a brief description of any future studies planned; and

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- An RFP to complete the business case for a new water treatment facility is going out in 2021 with expected completion in 2022. Pending funding approval, the design contract should follow in 2022.
- A design contract to upgrade the Johnston Cove sewage lift station was awarded in December 2020. The construction is expected to be tendered in October 2021. Once design documents are available, they will be submitted to NWB.
- Field studies are scheduled to take place for the upgrade of the wastewater treatment plant over the summer of 2021. More details on the schedule of this project are included below.

j) Any other details on Water use or waste disposal requested by the Board by November 1st of the year being reported.

- None

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

- The amendment application package was submitted on September 16th, 2020 by CGS to the Nunavut Water Board for municipal water license 3AM-GRA1624. The application is to move the annual resupply pumping location from Char River 200 m upstream to Lower Landing Lake, increase daily and annual pumping volumes, and associated changes to monitoring and reporting requirements in the current licence to reflect the change.
- The following tentative schedule is for the planning, design, and construction of a new mechanical wastewater treatment facility in Rankin Inlet. Note that contract award and construction years are dependent on success during funding applications.
 - o 2021: field studies
 - o 2022: Funding applications for design/build contract
 - o 2023: Award design/build contract
 - o 2024-2025 Construction and commissioning

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

- The 3AM-GRA1624 CIRNAC Inspection took place on August 11th, 2020.

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Appendix A: Rankin Inlet 2020 Sampling Summary – 4 pages

Appendix B: Laboratory Certificate of Analysis

- **Certificate of Analysis January 6, 2020 – 19 pages**
- **Certificate of Analysis February 18, 2020 – 20 pages**
- **Certificate of Analysis March 11, 2020 – 19 pages**
- **Certificate of Analysis April 20, 2020 – 20 pages**
- **Certificate of Analysis May 13, 2020 – 18 pages**
- **Certificate of Analysis June 3, 2020 – 19 pages**
- **Certificate of Analysis June 25, 2020 – 24 pages**
- **Certificate of Analysis July 23, 2020 – 20 pages**
- **Certificate of Analysis August 13, 2020 – 19 pages**
- **Certificate of Analysis September 2, 2020 – 20 pages**
- **Certificate of Analysis October 28 – 19 pages**
- **Certificate of Analysis December 7, 2020 – 19 pages**

Appendix C: Summary of Hydrocarbon Contamination Analysis – 1 page

Appendix D: Hazardous Materials Spill Database, Rankin Inlet 2020 – 1 page

Appendix E: CIRNAC Inspection Report – 4 pages

Appendix F: Licensee Representative Annual Inspection Report – 1 page

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Appendix A : Rankin Inlet 2020 Sampling Summary

**Rankin Inlet-CGS
GRA-1**

			2020
Parameter	Unit	DL	25-Jun-20
Alkalinity			
Bicarbonate (HCO ₃)	mg/L	1.2	35.9
Carbonate (CO ₃)	mg/L	0.60	0.60
Hydroxide (OH)	mg/L	0.34	0.34
Alkalinity, Total (as CaCO ₃)	mg/L	1.0	29.4
Ammonia by Colour			
Ammonia Total (as N)	mg/L	0.20	0.047
Biochemical Oxygen Demand (BOD)			
Biochemical Oxygen Demand	mg/L	6.0	2.0
Carbonaceous BOD			
BOD Carbonaceous	mg/L	6.0	2.0
Chloride in Water by IC			
Chloride (Cl)	mg/L	10	19
Conductivity (I)			
Conductivity	umhos/cm	1.0	143.0
Fecal Coliforms (I)			
Fecal Coliforms	MPN/100mL	3	10
Hardness Calculated			
Hardness (as CaCO ₃)	mg/L	0.30	42.4
Mercury Total			
Mercury (Hg)	mg/L	0.00020	0.0000050
Nitrate in Water by IC			
Nitrate (as N)	mg/L	0.40	0.020
Nitrate + Nitrite			
Nitrate and Nitrite as N	mg/L	0.45	0.070
Nitrite in Water by IC			
Nitrite (as N)	mg/L	0.20	0.010
Oil & Grease - Gravimetric			
Oil and Grease	mg/L	5.0	5.0
Phenol			
Phenols	mg/L	0.0010	0.0010
Phosphorus, Total			
Phosphorus (P)	mg/L	0.010	0.0123
Sulfate in Water by IC			
Sulfate (SO ₄)	mg/L	6.0	10.1
Total Metals by ICP-MS			
Aluminium (Al)	mg/L	0.0050	0.0301
Arsenic (As)	mg/L	0.00020	0.00086
Cadmium (Cd)	mg/L	0.000010	0.0000050
Calcium (Ca)	mg/L	0.10	13.1
Chromium (Cr)	mg/L	0.0010	0.00016
Cobalt (Co)	mg/L	0.00020	0.00012
Copper (Cu)	mg/L	0.00020	0.00096
Iron (Fe)	mg/L	0.010	0.062
Lead (Pb)	mg/L	0.000090	0.000105
Magnesium (Mg)	mg/L	0.010	2.38
Manganese (Mn)	mg/L	0.00030	0.0315
Nickel (Ni)	mg/L	0.0020	0.00253
Potassium (K)	mg/L	0.020	1.370
Sodium (Na)	mg/L	0.030	9.83
Zinc (Zn)	mg/L	0.0020	0.0030
Total Organic Carbon by Combustion			
Total Organic Carbon	mg/L	0.50	4.28
Total Suspended Solids (I)			
Total Suspended Solids	mg/L	13	3.0
pH			
pH	pH Units	0.10	7.43
Benzene	mg/L	0.00050	0.00050
Toluene	mg/L	0.0010	0.0010
Ethyl Benzene	mg/L	0.00050	0.00050
o-Xylene	mg/L	0.00050	0.00050
F1 (C6-C10)	mg/L	0.10	0.10
F2 (C10-C16)	mg/L	0.25	0.10
F3 (C16-C34)	mg/L	0.25	0.25
F4 (C34-C50)	mg/L	0.25	0.25
Total Hydrocarbons (C6-C50)	mg/L	0.44	N/A

Rankin Inlet-CGS
GRA-3

			2020										
Parameter	Unit	DL	06-Jan-20	18-Feb-20	11-Mar-20	20-Apr-20	13-May-20	03-Jun-20	23-Jul-20	13-Aug-20	02-Sep-20	26-Oct-20	07-Dec-20
Alkalinity													
Bicarbonate (HCO3)	mg/L	1.2	118	138	158	154	171	165	128	165	130	142	52.7
Carbonate (CO3)	mg/L	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	<0.60	<0.60	<0.60
Hydroxide (OH)	mg/L	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	<0.34	<0.34	<0.34
Total (as CaCO3)	mg/L	1.0	96.5	113	129	127	140	135	105	135	106	116	43.2
Ammonia by Colour													
Total Ammonia (as N)	mg/L	0.20	7.9	11.6	9.9	6.21	7.1	6.04	8.45	13.6	7.88	13.5	0.418
Biochemical Oxygen Demand (BOD)													
Biochemical Oxygen Demand	mg/L	6.0	101	115	148	95	119	64	85	123	116	159	6.3
Carbonaceous BOD													
BOD Carbonaceous	mg/L	6.0	90	109	177	74	113	53	66	112	104	141	5.4
Chloride in Water by IC													
Chloride (Cl)	mg/L	10	62.6	67.2	75.6	79	81.5	85.1	40.8	47.2	63.4	58	41.4
Conductivity (I)													
Conductivity	umhos/cm	1.0	460	500	575	590	610	620	388	472	468	507	276
Fecal Coliforms (I)													
Fecal Coliforms	MPN/100mL	3	24200	24200	24200	10100	24200	24200	24200	24200	>24200	>24200	2910
Hardness Calculated													
Hardness (as CaCO3)	mg/L	0.30	92.7	118	128	134	139	124	57.9	71.5	93.5	77.1	83.1
Mercury Total													
Mercury (Hg)	mg/L	0.0000050	0.0000050	0.0000070	0.0000120	0.0000120	0.0000160	0.0000110	0.0000110	0.0000130	0.0000110	0.0000183	<0.0000050
Nitrate in Water by IC													
Nitrate (as N)	mg/L	0.40	0.020	0.105	0.020	0.020	0.020	0.020	0.020	0.10	<0.020	<0.020	<0.020
Nitrate + Nitrite													
Nitrate and Nitrite as N	mg/L	0.45	0.070	0.123	0.070	0.070	0.070	0.070	0.070	0.11	<0.070	<0.070	<0.070
Nitrite in Water by IC													
Nitrite (as N)	mg/L	0.20	0.010	0.017	0.010	0.010	0.010	0.010	0.070	0.050	<0.010	0.016	<0.010
Oil & Grease - Gravimetric													
Oil and Grease	mg/L	5.0	17.4	80.0	30.4	22.7	25	9.1	16.5	40.8	2170	24.1	<5.0
Phenol													
Phenols	mg/L	0.0010	0.0096	0.0059	0.0123	0.0072	0.0096	0.0081	0.0130	0.0182	<0.010	0.0083	0.0011
Phosphorus, Total													
Phosphorus (P)	mg/L	0.010	2.330	1.730	2.860	2.360	2.820	1.990	2.860	4.280	2.500	4.510	0.127
Sulfate in Water by IC													
Sulfate (SO4)	mg/L	6.0	30.1	34.6	37.2	39.4	38.6	40.3	18.8	21.2	26	29.7	22.2
Total Metals by CRC ICPMS													
Aluminum (Al)	mg/L	0.0030	0.123	0.134	0.203	0.168	0.195	0.160	0.106	0.763	0.290	0.173	0.045
Antimony (Sb)	mg/L	0.00010	0.00019	0.00021	0.00025	0.00019	N/A	0.00017	0.00012	0.00021	0.00020	0.00037	<0.00010
Arsenic (As)	mg/L	0.000100	0.00086	0.00102	0.00104	0.00103	0.001060	0.00125	0.00089	0.0011	0.00181	0.00802	0.00085
Barium (Ba)	mg/L	0.00	0.0308	0.0378	0.0411	0.0454	N/A	0.0393	0.0198	0.0213	0.0285	0.022	0.024
Beryllium (Be)	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	N/A	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (Bi)	mg/L	0.00005	0.00370	0.00057	0.00379	0.00133	N/A	0.00170	0.00197	0.00598	0.00947	0.00065	0.00009
Boron (B)	mg/L	0.01000	0.045	0.122	0.141	0.089	N/A	0.077	0.067	0.074	0.082	0.070	0.041
Cadmium (Cd)	mg/L	0.000005	0.000111	0.000108	0.000079	0.000104	0.000130	0.000056	0.000078	0.000078	0.000094	0.000099	0.000011
Calcium (Ca)	mg/L	0.05	25.80	32.30	36.30	37.00	38.70	35.20	16.70	19.70	27.00	21.20	24.10
Cesium (Cs)	mg/L	0.000	0.000064	0.000076	0.000086	0.000084	N/A	0.00	0.000049	0.000083	0.000093	0.0001	0.000023
Chromium (Cr)	mg/L	0.00010	0.0006	0.0009	0.0017	0.0007	0.0010	0.0023	0.0006	0.0013	0.0012	0.0013	0.0027
Cobalt (Co)	mg/L	0.00010	0.00018	0.00016	0.00026	0.00018	0.00023	0.00025	0.00021	0.00029	0.00049	0.00032	0.00013
Copper (Cu)	mg/L	0.00050	0.1610	0.1920	0.2640	0.1710	0.2140	0.1700	0.1190	0.1800	0.1100	0.1920	0.0350
Iron (Fe)	mg/L	0.01000	0.2550	0.1770	0.7450	0.7040	0.7410	0.3660	0.4080	0.4690	0.6000	1.1400	0.6080
Lead (Pb)	mg/L	0.0001	0.0011	0.00185	0.00161	0.000941	0.000973	0.00078	0.00129	0.00137	0.000769	0.00237	0.000387
Lithium (Li)	mg/L	0.001	0.0032	0.0038	0.004	0.0044	N/A	0.00	0.0021	0.0023	0.0047	0.0028	0.0034
Magnesium (Mg)	mg/L	0.005	6.85	9.04	8.94	9.98	10.2	8.80	3.95	5.39	6.31	5.85	5.59
Manganese (Mn)	mg/L	0.000	0.0288	0.0227	0.0334	0.0406	0.0438	0.0	0.0352	0.0479	0.062	0.0303	0.0182
Molybdenum (Mo)	mg/L	0.000	0.00134	0.00103	0.00143	0.00105	0.00333	0.0	0.000757	0.000979	0.00091	0.00135	0.000894
Nickel (Ni)	mg/L	0.00050	0.00252	0.00320	0.00414	0.00328	N/A	0.00604	0.00241	0.00286	0.00324	0.00663	0.00313
Potassium (K)	mg/L	0.05	8.09	8.27	10.30	10.90	10.00	8.30	6.48	9.11	8.08	10.20	3.16
Phosphorus (P)	mg/L	0.0300	2.33	2.44	3.38	2.75	N/A	2.2	2.77	4.32	2.62	4.71	0.125
Rubidium (Rb)	mg/L	0.0002	0.00828	0.00835	0.0114	0.0112	N/A	0.00906	0.00698	0.00922	0.00898	0.0096	0.00274
Selenium (Se)	mg/L	0.0001	0.000188	0.000256	0.000213	0.000323	N/A	0.000152	0.000179	0.000421	0.000281	0.000297	0.000072
Silicon (Si)	mg/L	0.1000	0.28	0.34	0.55	0.43	N/A	0.47	0.29	0.78	1	0.53	0.011
Silver (Ag)	mg/L	0.0000	0.00003	0.00005	0.00007	0.00006	N/A	0.00002	0.00002	0.00005	0.00008	0.00005	<0.000010
Sodium (Na)	mg/L	0.05	35.10	44.80	49.40	47.50	49.60	46.00	22.60	33.00	36.70	36.30	25.30
Strontium (Sr)	mg/L	0.0002	0.13	0.151000	0.181	0.185	N/A	0.173	0.0807	0.0849	0.14	0.103	0.106
Sulfur (S)	mg/L	0.5000	11.2	14.200000	15.8	15.2	N/A	14.1	7.26	10.1	10.9	11.7	8.55
Tellurium (Te)	mg/L	0.0002	<0.00020	<0.00020	<0.00020	<0.00020	N/A	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium (Tl)	mg/L	0.0000	<0.000010	<0.000010	<0.000010	<0.000010	N/A	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	<0.000010
Thorium (Th)	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	N/A	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin (Sn)	mg/L	0.0001	0.00099	0.00107	0.00085	0.00062	N/A	0.00044	0.00061	0.00086	0.00061	0.00079	0.00011
Titanium (Ti)	mg/L	0.0003	0.00248	0.0177	0.00212	0.00167	N/A	0.00442	0.00475	0.00876	0.0157	0.00322	0.00085
Tungsten (W)	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	N/A	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium (U)	mg/L	0.0000	0.000172	0.000173	0.000190	0.000175	N/A	0.000157	0.000134	0.000207	0.000245	0.000231	0.000122
Vanadium (V)	mg/L	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	N/A	<0.00050	<0.00050	0.00083	0.0012	0.00131	0.00062
Zinc (Zn)	mg/L	0.0030	0.0619	0.0992	0.114000	0.0934	0.0965	0.0712	0.081	0.139	0.0841	0.146	0.0319
Zirconium (Zr)	mg/L	0.0002	0.00078	0.00065	0.00147	0.00059	N/A	0.00045	0.00050	0.00116	0.00088	0.0007	<0.00020
Total Organic Carbon by Combustion													
Total Organic Carbon	mg/L	0.50	58.4	49.2	75.2	52.3	58	51.5	61.9	78	63.8	96.8	9.74
Total Suspended Solids (I)													
Total Suspended Solids	mg/L	13	69.6	104	88.4	98.8	102	54.3	59.6	127	94.2	96.3	<3.0
pH													
pH	pH Units	0.10	6.99	7.27	7.20	7.20	7.18	7.45	7.25	7.37	7.23	7.29	7.54
Benzene	mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	<0.00050	<0.0005	<0.00050
Toluene	mg/L	0.0010	0.0011	0.0021	0.0010	0.0010	0.0010	0.0010	0.0011	0.0010	<0.0010	<0.0010	<0.0010
Ethyl Benzene	mg/L	0.00050	0.00050	0.00061	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/L	0.00050	0.00050	0.00096	0.00050	0.00095	0.00050	0.00050	0.00050	0.00050	<0.00050	<0.00050	<0.00050
F1 (C6-C10)	mg/L	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	<0.10	<0.10	<0.10
F2 (C10-C16)	mg/L	0.25	0.42	0.58	1.03	1.04	0.51	0.45	0.37	0.70	<0.10	<0.10	<0.10
F3 (C16-C34)	mg/L	0.25	7.17	9.28	12.7	7.65	10.5	5.52	8.58	12.3	1.11	1.1	0.3
F4 (C34-C50)	mg/L	0.25	2.42	2.86	5.75	2.93	3.12	2.02	2.54	4.24	0.77	0.57	<0.25
Total Hydrocarbons (C6-C50)	mg/L	0.44	10.0	12.7	19.5	11.6	14.2	8.0	11.2	1.88	N/A	N/A	<0.38
Fluoride (F)	mg/L	0.02	0.162	0.087	0.227	0.160	0.157	0.202	0.192	0.11	0.176	0.156	0.074
Total and E. Coli													
Total Coliforms	MPN/100mL	10	24										

**Rankin Inlet-CGS
GRA-6**

			2020
Parameter	Unit	DL	25-Jun-20
Alkalinity			
Bicarbonate (HCO ₃)	mg/L	1.2	14.4
Carbonate (CO ₃)	mg/L	0.60	0.60
Hydroxide (OH)	mg/L	0.34	0.34
Alkalinity, Total (as CaCO ₃)	mg/L	1.0	11.8
Ammonia by Colour			
Ammonia Total (as N)	mg/L	0.20	0.010
Biochemical Oxygen Demand (BOD)			
Biochemical Oxygen Demand	mg/L	6.0	2.0
Carbonaceous BOD			
BOD Carbonaceous	mg/L	6.0	2.0
Chloride in Water by IC			
Chloride (Cl)	mg/L	10	6.59
Conductivity (I)			
Conductivity	umhos/cm	1.0	52.9
Fecal Coliforms (I)			
Fecal Coliforms	MPN/100mL	3	10
Hardness Calculated			
Hardness (as CaCO ₃)	mg/L	0.30	15
Mercury Total			
Mercury (Hg)	mg/L	0.00020	0.0000050
Nitrate in Water by IC			
Nitrate (as N)	mg/L	0.40	0.020
Nitrate + Nitrite			
Nitrate and Nitrite as N	mg/L	0.45	0.070
Nitrite in Water by IC			
Nitrite (as N)	mg/L	0.20	0.010
Oil & Grease - Gravimetric			
Oil and Grease	mg/L	5.0	5.0
Phenol			
Phenols	mg/L	0.0010	0.0010
Phosphorus, Total			
Phosphorus (P)	mg/L	0.010	0.0087
Sulfate in Water by IC			
Sulfate (SO ₄)	mg/L	6.0	2.02
Total Metals by ICP-MS			
Aluminium (Al)	mg/L	0.0050	0.0162
Arsenic (As)	mg/L	0.00020	0.000042
Cadmium (Cd)	mg/L	0.000010	0.0000050
Calcium (Ca)	mg/L	0.10	4.63
Chromium (Cr)	mg/L	0.0010	0.00010
Cobalt (Co)	mg/L	0.00020	0.00010
Copper (Cu)	mg/L	0.00020	0.0007
Iron (Fe)	mg/L	0.010	0.081
Lead (Pb)	mg/L	0.000090	0.000050
Magnesium (Mg)	mg/L	0.010	0.834
Manganese (Mn)	mg/L	0.00030	0.00640
Nickel (Ni)	mg/L	0.0020	0.00053
Potassium (K)	mg/L	0.020	0.782
Sodium (Na)	mg/L	0.030	3.15
Zinc (Zn)	mg/L	0.0020	0.0030
Total Organic Carbon by Combustion			
Total Organic Carbon	mg/L	0.50	3.48
Total Suspended Solids (I)			
Total Suspended Solids	mg/L	13	3.0
pH			
pH	pH Units	0.10	7.15
Benzene	mg/L	0.00050	0.00050
Toluene	mg/L	0.0010	0.0010
Ethyl Benzene	mg/L	0.00050	0.00050
o-Xylene	mg/L	0.00050	0.00050
F1 (C6-C10)	mg/L	0.10	0.10
F2 (C10-C16)	mg/L	0.25	0.10
F3 (C16-C34)	mg/L	0.25	0.25
F4 (C34-C50)	mg/L	0.25	0.25
Total Hydrocarbons (C6-C50)	mg/L	0.44	N/A

**Rankin Inlet-CGS
GRA-7**

			2020
Parameter	Unit	DL	25-Jun-20
Alkalinity			
Bicarbonate (HCO ₃)	mg/L	1.2	13.4
Carbonate (CO ₃)	mg/L	0.60	0.60
Hydroxide (OH)	mg/L	0.34	0.34
Alkalinity, Total (as CaCO ₃)	mg/L	1.0	11.0
Ammonia by Colour			
Ammonia Total (as N)	mg/L	0.20	0.010
Biochemical Oxygen Demand (BOD)			
Biochemical Oxygen Demand	mg/L	6.0	2.0
Carbonaceous BOD			
BOD Carbonaceous	mg/L	6.0	2.0
Chloride in Water by IC			
Chloride (Cl)	mg/L	10	6.04
Conductivity (I)			
Conductivity	umhos/cm	1.0	48.2
Fecal Coliforms (I)			
Fecal Coliforms	MPN/100mL	3	10
Hardness Calculated			
Hardness (as CaCO ₃)	mg/L	0.30	13.9
Mercury Total			
Mercury (Hg)	mg/L	0.00020	0.0000050
Nitrate in Water by IC			
Nitrate (as N)	mg/L	0.40	0.020
Nitrate + Nitrite			
Nitrate and Nitrite as N	mg/L	0.45	0.070
Nitrite in Water by IC			
Nitrite (as N)	mg/L	0.20	0.010
Oil & Grease - Gravimetric			
Oil and Grease	mg/L	5.0	5.0
Phenol			
Phenols	mg/L	0.0010	0.0010
Phosphorus, Total			
Phosphorus (P)	mg/L	0.010	0.0100
Sulfate in Water by IC			
Sulfate (SO ₄)	mg/L	6.0	1.83
Total Metals by ICP-MS			
Aluminium (Al)	mg/L	0.0050	0.0198
Arsenic (As)	mg/L	0.00020	0.00041
Cadmium (Cd)	mg/L	0.000010	0.0000050
Calcium (Ca)	mg/L	0.10	4.26
Chromium (Cr)	mg/L	0.0010	0.00010
Cobalt (Co)	mg/L	0.00020	0.00010
Copper (Cu)	mg/L	0.00020	0.00066
Iron (Fe)	mg/L	0.010	0.082
Lead (Pb)	mg/L	0.000090	0.000050
Magnesium (Mg)	mg/L	0.010	0.779
Manganese (Mn)	mg/L	0.00030	0.00686
Nickel (Ni)	mg/L	0.0020	0.00050
Potassium (K)	mg/L	0.020	0.738
Sodium (Na)	mg/L	0.030	3.13
Zinc (Zn)	mg/L	0.0020	0.0030
Total Organic Carbon by Combustion			
Total Organic Carbon	mg/L	0.50	3.03
Total Suspended Solids (I)			
Total Suspended Solids	mg/L	13	3.0
pH			
pH	pH Units	0.10	7.33
Benzene	mg/L	0.00050	0.00050
Toluene	mg/L	0.0010	0.0010
Ethyl Benzene	mg/L	0.00050	0.00050
o-Xylene	mg/L	0.00050	0.00050
F1 (C6-C10)	mg/L	0.10	0.10
F2 (C10-C16)	mg/L	0.25	0.10
F3 (C16-C34)	mg/L	0.25	0.25
F4 (C34-C50)	mg/L	0.25	0.25
Total Hydrocarbons (C6-C50)	mg/L	0.44	N/A

**ANNUAL REPORT
FOR GN-CGS RANKIN INLET**

Appendix B: Laboratory Certificate of Analysis



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

Date Received: 07-JAN-20
Report Date: 16-JAN-20 07:24 (MT)
Version: FINAL

Client Phone: 867-645-8155

Certificate of Analysis

Lab Work Order #: L2402722
Project P.O. #: NOT SUBMITTED
Job Reference: RANKIN INLET WWTP - MONTHLY EFFLUENT
C of C Numbers:
Legal Site Desc:

Comments: NOTE: Incorrect date & time sampled on CofC form - Sample was taken Monday Jan 6th @ 3:30 pm and received at ALS Labs Tuesday Jan 7th @ 11:13 am

Hua Wo
Chemistry Laboratory Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2402722-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 06-JAN-20 @ 15:30							
Matrix: WASTE							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		07-JAN-20	R4963647
Toluene	0.0011		0.0010	mg/L		07-JAN-20	R4963647
Ethyl benzene	<0.00050		0.00050	mg/L		07-JAN-20	R4963647
o-Xylene	<0.00050		0.00050	mg/L		07-JAN-20	R4963647
m+p-Xylenes	<0.00040		0.00040	mg/L		07-JAN-20	R4963647
F1 (C6-C10)	<0.10		0.10	mg/L		07-JAN-20	R4963647
Surrogate: 4-Bromofluorobenzene (SS)	84.1		70-130	%		07-JAN-20	R4963647
CCME PHC F2-F4 in Water							
F2 (C10-C16)	0.42		0.10	mg/L	08-JAN-20	08-JAN-20	R4965831
F3 (C16-C34)	7.17		0.25	mg/L	08-JAN-20	08-JAN-20	R4965831
F4 (C34-C50)	2.42		0.25	mg/L	08-JAN-20	08-JAN-20	R4965831
Surrogate: 2-Bromobenzotrifluoride	103.1		60-140	%	08-JAN-20	08-JAN-20	R4965831
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		15-JAN-20	
F2-Naphth	0.42		0.10	mg/L		15-JAN-20	
F3-PAH	7.17		0.25	mg/L		15-JAN-20	
Total Hydrocarbons (C6-C50)	10.0		0.38	mg/L		15-JAN-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		08-JAN-20	
Miscellaneous Parameters							
Fluoride (F)	0.162		0.020	mg/L		08-JAN-20	R4965763
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	>24200		10	MPN/100mL		07-JAN-20	R4963497
Escherichia Coli	>24200		10	MPN/100mL		07-JAN-20	R4963497
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
2-Methyl Naphthalene	0.000021		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Acenaphthene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Acenaphthylene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Anthracene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Acridine	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Benzo(a)anthracene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	13-JAN-20	13-JAN-20	R4964572
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Chrysene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	13-JAN-20	13-JAN-20	R4964572
Fluoranthene	<0.000020		0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Fluorene	0.000028	EMPC	0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Naphthalene	<0.000050		0.000050	mg/L	13-JAN-20	13-JAN-20	R4964572
Phenanthrene	<0.000050		0.000050	mg/L	13-JAN-20	13-JAN-20	R4964572
Pyrene	<0.000010		0.000010	mg/L	13-JAN-20	13-JAN-20	R4964572
Quinoline	0.000026	EMPC	0.000020	mg/L	13-JAN-20	13-JAN-20	R4964572
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	13-JAN-20	13-JAN-20	R4964572
Surrogate: Acenaphthene d10	108.8		60-130	%	13-JAN-20	13-JAN-20	R4964572
Surrogate: Acridine d9	112.9		60-130	%	13-JAN-20	13-JAN-20	R4964572
Surrogate: Chrysene d12	109.1		60-130	%	13-JAN-20	13-JAN-20	R4964572
Surrogate: Naphthalene d8	113.9		50-130	%	13-JAN-20	13-JAN-20	R4964572
Surrogate: Phenanthrene d10	115.4		60-130	%	13-JAN-20	13-JAN-20	R4964572

* 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
L2402722-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 06-JAN-20 @ 15:30							
Matrix: WASTE							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	118		1.2	mg/L		09-JAN-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		09-JAN-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		09-JAN-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	96.5		1.0	mg/L		08-JAN-20	R4965553
Ammonia by colour							
Ammonia, Total (as N)	7.9		1.0	mg/L		08-JAN-20	R4965993
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	101		20	mg/L		08-JAN-20	R4969406
Carbonaceous BOD							
BOD Carbonaceous	90		20	mg/L		08-JAN-20	R4969406
Chloride in Water by IC							
Chloride (Cl)	62.6		0.50	mg/L		08-JAN-20	R4965763
Conductivity							
Conductivity	460		1.0	umhos/cm		08-JAN-20	R4965553
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	>24200		10	MPN/100mL		07-JAN-20	R4963495
Hardness Calculated							
Hardness (as CaCO3)	92.7	HTC	0.20	mg/L		16-JAN-20	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	14-JAN-20	14-JAN-20	R4969808
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		08-JAN-20	R4965763
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		09-JAN-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		08-JAN-20	R4965763
Oil & Grease - Gravimetric							
Oil and Grease	17.4		5.0	mg/L		10-JAN-20	R4966414
Phenol (4AAP)							
Phenols (4AAP)	0.0096		0.0010	mg/L		08-JAN-20	R4965169
Phosphorus, Total							
Phosphorus (P)-Total	2.10		0.030	mg/L		09-JAN-20	R4965745
Sulfate in Water by IC							
Sulfate (SO4)	30.1		0.30	mg/L		08-JAN-20	R4965763
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.123		0.0030	mg/L	14-JAN-20	14-JAN-20	R4969366
Antimony (Sb)-Total	0.00019		0.00010	mg/L	14-JAN-20	14-JAN-20	R4969366
Arsenic (As)-Total	0.00086		0.00010	mg/L	14-JAN-20	14-JAN-20	R4969366
Barium (Ba)-Total	0.0308		0.00010	mg/L	14-JAN-20	14-JAN-20	R4969366
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	14-JAN-20	14-JAN-20	R4969366
Bismuth (Bi)-Total	0.00370		0.000050	mg/L	14-JAN-20	14-JAN-20	R4969366
Boron (B)-Total	0.045		0.010	mg/L	14-JAN-20	14-JAN-20	R4969366
Cadmium (Cd)-Total	0.000111		0.0000050	mg/L	14-JAN-20	14-JAN-20	R4969366
Calcium (Ca)-Total	25.8		0.050	mg/L	14-JAN-20	14-JAN-20	R4969366
Cesium (Cs)-Total	0.000064		0.000010	mg/L	14-JAN-20	14-JAN-20	R4969366
Chromium (Cr)-Total	0.00061		0.00010	mg/L	14-JAN-20	14-JAN-20	R4969366
Cobalt (Co)-Total	0.00018		0.00010	mg/L	14-JAN-20	14-JAN-20	R4969366
Copper (Cu)-Total	0.161		0.00050	mg/L	14-JAN-20	14-JAN-20	R4969366

* 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
L2402722-1 RANKIN INLET WWTP - EFFLUENT								
Sampled By: SD on 06-JAN-20 @ 15:30								
Matrix: WASTE								
Total Metals in Water by CRC ICPMS								
Iron (Fe)-Total		0.255		0.010	mg/L	14-JAN-20	14-JAN-20	R4969366
Lead (Pb)-Total		0.00110		0.000050	mg/L	14-JAN-20	14-JAN-20	R4969366
Lithium (Li)-Total		0.0032		0.0010	mg/L	14-JAN-20	14-JAN-20	R4969366
Magnesium (Mg)-Total		6.85		0.0050	mg/L	14-JAN-20	14-JAN-20	R4969366
Manganese (Mn)-Total		0.0288		0.00010	mg/L	14-JAN-20	14-JAN-20	R4969366
Molybdenum (Mo)-Total		0.00134		0.000050	mg/L	14-JAN-20	14-JAN-20	R4969366
Nickel (Ni)-Total		0.00252		0.00050	mg/L	14-JAN-20	14-JAN-20	R4969366
Potassium (K)-Total		8.09		0.050	mg/L	14-JAN-20	14-JAN-20	R4969366
Phosphorus (P)-Total		2.33		0.030	mg/L	14-JAN-20	14-JAN-20	R4969366
Rubidium (Rb)-Total		0.00828		0.00020	mg/L	14-JAN-20	14-JAN-20	R4969366
Selenium (Se)-Total		0.000188		0.000050	mg/L	14-JAN-20	14-JAN-20	R4969366
Silicon (Si)-Total		0.28		0.10	mg/L	14-JAN-20	14-JAN-20	R4969366
Silver (Ag)-Total		0.000032		0.000010	mg/L	14-JAN-20	14-JAN-20	R4969366
Sodium (Na)-Total		35.1		0.050	mg/L	14-JAN-20	14-JAN-20	R4969366
Strontium (Sr)-Total		0.130		0.00020	mg/L	14-JAN-20	14-JAN-20	R4969366
Sulfur (S)-Total		11.2		0.50	mg/L	14-JAN-20	14-JAN-20	R4969366
Tellurium (Te)-Total		<0.00020		0.00020	mg/L	14-JAN-20	14-JAN-20	R4969366
Thallium (Tl)-Total		<0.000010		0.000010	mg/L	14-JAN-20	14-JAN-20	R4969366
Thorium (Th)-Total		<0.00010		0.00010	mg/L	14-JAN-20	14-JAN-20	R4969366
Tin (Sn)-Total		0.00099		0.00010	mg/L	14-JAN-20	14-JAN-20	R4969366
Titanium (Ti)-Total		0.00248		0.00030	mg/L	14-JAN-20	14-JAN-20	R4969366
Tungsten (W)-Total		<0.00010		0.00010	mg/L	14-JAN-20	14-JAN-20	R4969366
Uranium (U)-Total		0.000172		0.000010	mg/L	14-JAN-20	14-JAN-20	R4969366
Vanadium (V)-Total		<0.00050		0.00050	mg/L	14-JAN-20	14-JAN-20	R4969366
Zinc (Zn)-Total		0.0619		0.0030	mg/L	14-JAN-20	14-JAN-20	R4969366
Zirconium (Zr)-Total		0.00078		0.00020	mg/L	14-JAN-20	14-JAN-20	R4969366
Total Organic Carbon by Combustion								
Total Organic Carbon		58.4		5.0	mg/L		09-JAN-20	R4966263
Total Suspended Solids								
Total Suspended Solids		69.6		6.0	mg/L		13-JAN-20	R4969388
pH								
pH		6.99		0.10	pH units		08-JAN-20	R4965553

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
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.

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 transferred 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.			
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.			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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
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.			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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 aqueous 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 Substrate 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.



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-TOC-HTC-WP	Water							
Batch	R4966263							
WG3255732-2	LCS							
Total Organic Carbon			103.1		%		80-120	09-JAN-20
WG3255732-1	MB							
Total Organic Carbon			<0.50		mg/L		0.5	09-JAN-20
CL-IC-N-WP	Water							
Batch	R4965763							
WG3254447-2	LCS							
Chloride (Cl)			101.1		%		90-110	08-JAN-20
WG3254447-1	MB							
Chloride (Cl)			<0.50		mg/L		0.5	08-JAN-20
E C-WP	Water							
Batch	R4965553							
WG3254996-10	DUP	L2402722-1						
Conductivity		460	461		umhos/cm	0.2	10	08-JAN-20
WG3254996-8	LCS							
Conductivity			100.4		%		90-110	08-JAN-20
WG3254996-6	MB							
Conductivity			<1.0		umhos/cm		1	08-JAN-20
F-IC-N-WP	Water							
Batch	R4965763							
WG3254447-2	LCS							
Fluoride (F)			103.2		%		90-110	08-JAN-20
WG3254447-1	MB							
Fluoride (F)			<0.020		mg/L		0.02	08-JAN-20
F2-F4-FID-WP	Water							
Batch	R4965831							
WG3254398-2	LCS							
F2 (C10-C16)			98.4		%		70-130	08-JAN-20
F3 (C16-C34)			95.9		%		70-130	08-JAN-20
F4 (C34-C50)			102.7		%		70-130	08-JAN-20
WG3254398-1	MB							
F2 (C10-C16)			<0.10		mg/L		0.1	08-JAN-20
F3 (C16-C34)			<0.25		mg/L		0.25	08-JAN-20
F4 (C34-C50)			<0.25		mg/L		0.25	08-JAN-20
Surrogate: 2-Bromobenzotrifluoride			104.6		%		60-140	08-JAN-20
FC10-QT97-WP	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
FC10-QT97-WP	Water							
Batch	R4963495							
WG3253911-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	07-JAN-20
HG-T-CVAA-WP	Water							
Batch	R4969808							
WG3258095-2 LCS								
Mercury (Hg)-Total			96.0		%		80-120	14-JAN-20
WG3258095-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	14-JAN-20
MET-T-CCMS-WP	Water							
Batch	R4969366							
WG3256973-2 LCS								
Aluminum (Al)-Total			102.8		%		80-120	14-JAN-20
Antimony (Sb)-Total			97.0		%		80-120	14-JAN-20
Arsenic (As)-Total			101.8		%		80-120	14-JAN-20
Barium (Ba)-Total			101.4		%		80-120	14-JAN-20
Beryllium (Be)-Total			100.1		%		80-120	14-JAN-20
Bismuth (Bi)-Total			96.6		%		80-120	14-JAN-20
Boron (B)-Total			99.4		%		80-120	14-JAN-20
Cadmium (Cd)-Total			100.9		%		80-120	14-JAN-20
Calcium (Ca)-Total			97.2		%		80-120	14-JAN-20
Cesium (Cs)-Total			99.1		%		80-120	14-JAN-20
Chromium (Cr)-Total			103.2		%		80-120	14-JAN-20
Cobalt (Co)-Total			101.0		%		80-120	14-JAN-20
Copper (Cu)-Total			102.1		%		80-120	14-JAN-20
Iron (Fe)-Total			92.9		%		80-120	14-JAN-20
Lead (Pb)-Total			97.3		%		80-120	14-JAN-20
Lithium (Li)-Total			101.7		%		80-120	14-JAN-20
Magnesium (Mg)-Total			112.8		%		80-120	14-JAN-20
Manganese (Mn)-Total			101.1		%		80-120	14-JAN-20
Molybdenum (Mo)-Total			95.6		%		80-120	14-JAN-20
Nickel (Ni)-Total			98.4		%		80-120	14-JAN-20
Potassium (K)-Total			102.6		%		80-120	14-JAN-20
Phosphorus (P)-Total			107.0		%		80-120	14-JAN-20
Rubidium (Rb)-Total			100.2		%		80-120	14-JAN-20
Selenium (Se)-Total			99.2		%		80-120	14-JAN-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R4969366							
WG3256973-2 LCS								
Silicon (Si)-Total			101.9		%		80-120	14-JAN-20
Silver (Ag)-Total			95.3		%		80-120	14-JAN-20
Sodium (Na)-Total			104.6		%		80-120	14-JAN-20
Strontium (Sr)-Total			100.7		%		80-120	14-JAN-20
Sulfur (S)-Total			107.6		%		80-120	14-JAN-20
Tellurium (Te)-Total			98.5		%		80-120	14-JAN-20
Thallium (Tl)-Total			96.7		%		80-120	14-JAN-20
Thorium (Th)-Total			97.0		%		80-120	14-JAN-20
Tin (Sn)-Total			93.9		%		80-120	14-JAN-20
Titanium (Ti)-Total			99.99		%		80-120	14-JAN-20
Tungsten (W)-Total			96.6		%		80-120	14-JAN-20
Uranium (U)-Total			102.9		%		80-120	14-JAN-20
Vanadium (V)-Total			101.5		%		80-120	14-JAN-20
Zinc (Zn)-Total			100.8		%		80-120	14-JAN-20
Zirconium (Zr)-Total			93.9		%		80-120	14-JAN-20
WG3256973-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	14-JAN-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	14-JAN-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	14-JAN-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	14-JAN-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	14-JAN-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	14-JAN-20
Boron (B)-Total			<0.010		mg/L		0.01	14-JAN-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	14-JAN-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	14-JAN-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	14-JAN-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	14-JAN-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	14-JAN-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	14-JAN-20
Iron (Fe)-Total			<0.010		mg/L		0.01	14-JAN-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	14-JAN-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	14-JAN-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	14-JAN-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	14-JAN-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R4969366							
WG3256973-1 MB								
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	14-JAN-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	14-JAN-20
Potassium (K)-Total			<0.050		mg/L		0.05	14-JAN-20
Phosphorus (P)-Total			<0.030		mg/L		0.03	14-JAN-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	14-JAN-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	14-JAN-20
Silicon (Si)-Total			<0.10		mg/L		0.1	14-JAN-20
Silver (Ag)-Total			<0.000010		mg/L		0.00001	14-JAN-20
Sodium (Na)-Total			<0.050		mg/L		0.05	14-JAN-20
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	14-JAN-20
Sulfur (S)-Total			<0.50		mg/L		0.5	14-JAN-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	14-JAN-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	14-JAN-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	14-JAN-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	14-JAN-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	14-JAN-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	14-JAN-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	14-JAN-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	14-JAN-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	14-JAN-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	14-JAN-20
NH3-COL-WP	Water							
Batch	R4965993							
WG3254923-26 LCS								
Ammonia, Total (as N)			91.3		%		85-115	08-JAN-20
WG3254923-25 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	08-JAN-20
N02-IC-N-WP	Water							
Batch	R4965763							
WG3254447-2 LCS								
Nitrite (as N)			103.4		%		90-110	08-JAN-20
WG3254447-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	08-JAN-20
N03-IC-N-WP	Water							

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
N03-IC-N-WP	Water							
Batch	R4965763							
WG3254447-2	LCS							
Nitrate (as N)			103.2		%		90-110	08-JAN-20
WG3254447-1	MB							
Nitrate (as N)			<0.020		mg/L		0.02	08-JAN-20
OG-GRAV-WP	Water							
Batch	R4966414							
WG3254925-2	LCS							
Oil and Grease			86.2		%		70-130	10-JAN-20
WG3254925-1	MB							
Oil and Grease			<5.0		mg/L		5	10-JAN-20
P-T-COL-WP	Water							
Batch	R4965745							
WG3254653-6	LCS							
Phosphorus (P)-Total			98.1		%		80-120	09-JAN-20
WG3254653-5	MB							
Phosphorus (P)-Total			<0.0030		mg/L		0.003	09-JAN-20
PAH,PANH-WP	Water							
Batch	R4964572							
WG3256843-2	LCS							
1-Methyl Naphthalene			120.6		%		60-130	13-JAN-20
2-Methyl Naphthalene			119.5		%		60-130	13-JAN-20
Acenaphthene			116.2		%		60-130	13-JAN-20
Acenaphthylene			113.8		%		60-130	13-JAN-20
Anthracene			90.8		%		60-130	13-JAN-20
Acridine			103.1		%		60-130	13-JAN-20
Benzo(a)anthracene			92.3		%		60-130	13-JAN-20
Benzo(a)pyrene			104.5		%		60-130	13-JAN-20
Benzo(b&j)fluoranthene			106.1		%		60-130	13-JAN-20
Benzo(g,h,i)perylene			120.7		%		60-130	13-JAN-20
Benzo(k)fluoranthene			118.0		%		60-130	13-JAN-20
Chrysene			92.1		%		60-130	13-JAN-20
Dibenzo(a,h)anthracene			118.2		%		60-130	13-JAN-20
Fluoranthene			117.6		%		60-130	13-JAN-20
Fluorene			110.0		%		60-130	13-JAN-20
Indeno(1,2,3-cd)pyrene			97.1		%		60-130	13-JAN-20
Naphthalene			120.0		%		50-130	13-JAN-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH,PANH-WP		Water						
Batch R4964572								
WG3256843-2 LCS								
Phenanthrene			109.7		%		60-130	13-JAN-20
Pyrene			120.9		%		60-130	13-JAN-20
Quinoline			119.0		%		60-130	13-JAN-20
WG3256843-1 MB								
1-Methyl Naphthalene			<0.000020		mg/L		0.00002	13-JAN-20
2-Methyl Naphthalene			<0.000020		mg/L		0.00002	13-JAN-20
Acenaphthene			<0.000020		mg/L		0.00002	13-JAN-20
Acenaphthylene			<0.000020		mg/L		0.00002	13-JAN-20
Anthracene			<0.000010		mg/L		0.00001	13-JAN-20
Acridine			<0.000020		mg/L		0.00002	13-JAN-20
Benzo(a)anthracene			<0.000010		mg/L		0.00001	13-JAN-20
Benzo(a)pyrene			<0.000005C		mg/L		0.000005	13-JAN-20
Benzo(b&j)fluoranthene			<0.000010		mg/L		0.00001	13-JAN-20
Benzo(g,h,i)perylene			<0.000020		mg/L		0.00002	13-JAN-20
Benzo(k)fluoranthene			<0.000010		mg/L		0.00001	13-JAN-20
Chrysene			<0.000020		mg/L		0.00002	13-JAN-20
Dibenzo(a,h)anthracene			<0.000005C		mg/L		0.000005	13-JAN-20
Fluoranthene			<0.000020		mg/L		0.00002	13-JAN-20
Fluorene			<0.000020		mg/L		0.00002	13-JAN-20
Indeno(1,2,3-cd)pyrene			<0.000010		mg/L		0.00001	13-JAN-20
Naphthalene			<0.000050		mg/L		0.00005	13-JAN-20
Phenanthrene			<0.000050		mg/L		0.00005	13-JAN-20
Pyrene			<0.000010		mg/L		0.00001	13-JAN-20
Quinoline			<0.000020		mg/L		0.00002	13-JAN-20
Surrogate: Acenaphthene d10			99.1		%		60-130	13-JAN-20
Surrogate: Acridine d9			91.9		%		60-130	13-JAN-20
Surrogate: Chrysene d12			111.2		%		60-130	13-JAN-20
Surrogate: Naphthalene d8			97.4		%		50-130	13-JAN-20
Surrogate: Phenanthrene d10			99.8		%		60-130	13-JAN-20
PH-WP		Water						
Batch R4965553								
WG3254996-10 DUP		L2402722-1						
pH		6.99	6.97	J	pH units	0.02	0.2	08-JAN-20
WG3254996-7 LCS								
pH			7.36		pH units		7.3-7.5	08-JAN-20



Quality Control Report

Workorder: L2402722

Report Date: 16-JAN-20

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PHENOLS-4AAP-WT	Water							
Batch	R4965169							
WG3254485-3	DUP	L2402722-1						
Phenols (4AAP)		0.0096	0.0102		mg/L	6.1	20	08-JAN-20
WG3254485-2	LCS							
Phenols (4AAP)			97.6		%		85-115	08-JAN-20
WG3254485-1	MB							
Phenols (4AAP)			<0.0010		mg/L		0.001	08-JAN-20
WG3254485-4	MS	L2402722-1						
Phenols (4AAP)			96.9		%		75-125	08-JAN-20
S04-IC-N-WP	Water							
Batch	R4965763							
WG3254447-2	LCS							
Sulfate (SO4)			102.6		%		90-110	08-JAN-20
WG3254447-1	MB							
Sulfate (SO4)			<0.30		mg/L		0.3	08-JAN-20
SOLIDS-TOTSUS-WP	Water							
Batch	R4969388							
WG3256681-2	LCS							
Total Suspended Solids			93.1		%		85-115	13-JAN-20
WG3256681-1	MB							
Total Suspended Solids			<2.0		mg/L		2	13-JAN-20
TC,EC10-QT97-WP	Water							
Batch	R4963497							
WG3253913-2	DUP	L2402722-1						
Total Coliforms		>24200	>24200		MPN/100mL	0.0	65	07-JAN-20
Escherichia Coli		>24200	>24200		MPN/100mL	0.0	65	07-JAN-20
WG3253913-1	MB							
Total Coliforms			<1		MPN/100mL		1	07-JAN-20
Escherichia Coli			<1		MPN/100mL		1	07-JAN-20

Quality Control Report

Workorder: L2402722

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Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.

Quality Control Report

Workorder: L2402722

Report Date: 16-JAN-20

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH	1	06-JAN-20 15:30	08-JAN-20 12:00	0.25	44	hours	EHTR-FM

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 L2402722 were received on 07-JAN-20 11:13.

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.

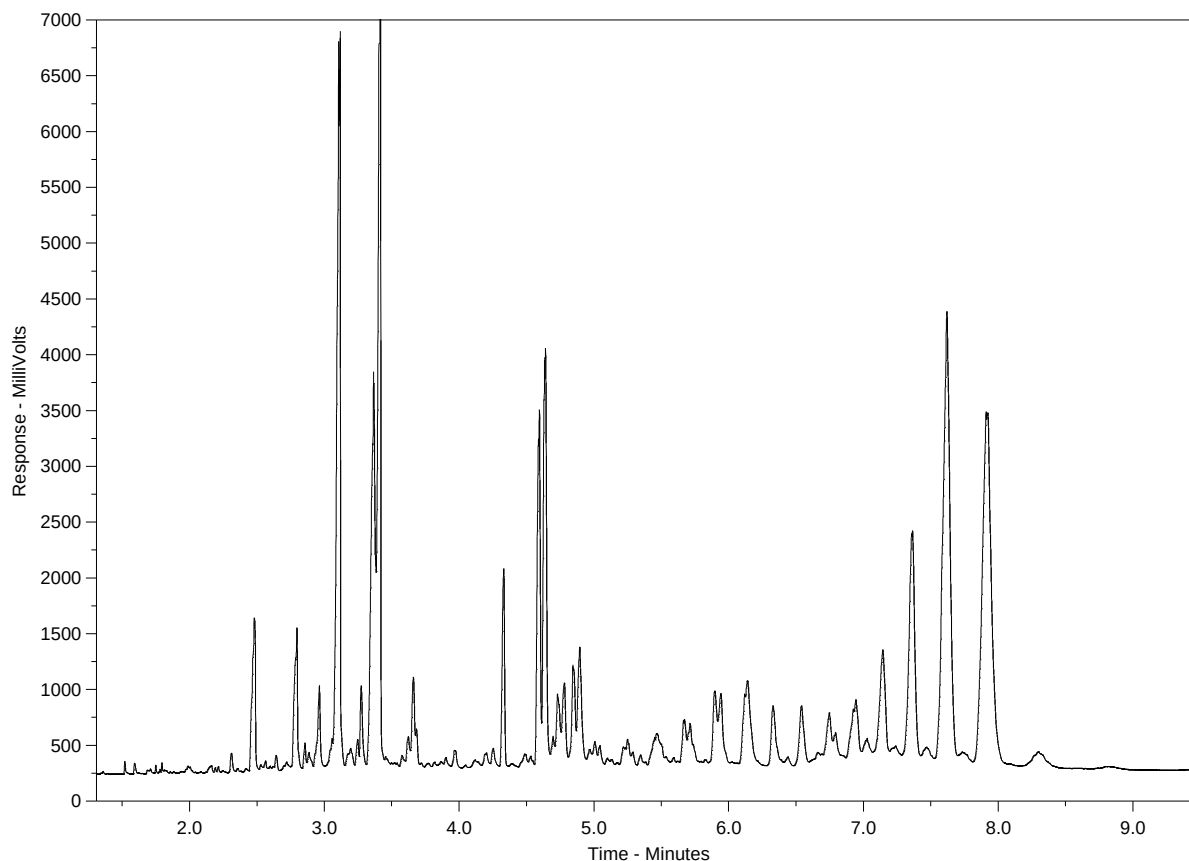
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide 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: L2402722-1
Client Sample ID: RANKIN INLET WWTP - EFFLUENT



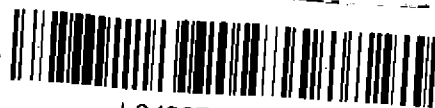
← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →		← Motor Oils/ Lube Oils/ Grease →			
← Diesel/ Jet Fuels →					

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.



L2402722-COFC

COC #

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

Date Received: 19-FEB-20
Report Date: 03-MAR-20 12:18 (MT)
Version: FINAL

Client Phone: 867-645-8155

Certificate of Analysis

Lab Work Order #: L2418503
Project P.O. #: NOT SUBMITTED
Job Reference: RANKIN INLET WWTP - MONTHLY EFFLUENT
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 1329 Niakwa Road East, Unit 12, Winnipeg, MB R2J 3T4 Canada | Phone: +1 204 255 9720 | Fax: +1 204 255 9721
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2418503-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 18-FEB-20 @ 10:30							
Matrix: WASTE							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		24-FEB-20	R5005413
Toluene	0.0021		0.0010	mg/L		24-FEB-20	R5005413
Ethyl benzene	0.00061		0.00050	mg/L		24-FEB-20	R5005413
o-Xylene	0.00096		0.00050	mg/L		24-FEB-20	R5005413
m+p-Xylenes	0.00192		0.00040	mg/L		24-FEB-20	R5005413
F1 (C6-C10)	<0.10		0.10	mg/L		24-FEB-20	R5005413
Surrogate: 4-Bromofluorobenzene (SS)	81.8		70-130	%		24-FEB-20	R5005413
CCME PHC F2-F4 in Water							
F2 (C10-C16)	0.58		0.10	mg/L	20-FEB-20	20-FEB-20	R4999313
F3 (C16-C34)	9.28		0.25	mg/L	20-FEB-20	20-FEB-20	R4999313
F4 (C34-C50)	2.86		0.25	mg/L	20-FEB-20	20-FEB-20	R4999313
Surrogate: 2-Bromobenzotrifluoride	101.6		60-140	%	20-FEB-20	20-FEB-20	R4999313
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		03-MAR-20	
F2-Naphth	0.58		0.10	mg/L		03-MAR-20	
F3-PAH	9.28		0.25	mg/L		03-MAR-20	
Total Hydrocarbons (C6-C50)	12.7		0.38	mg/L		03-MAR-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	0.00288		0.00064	mg/L		27-FEB-20	
Miscellaneous Parameters							
Fluoride (F)	0.087		0.020	mg/L		20-FEB-20	R4999549
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	>24200	MBHT	10	MPN/100mL		19-FEB-20	R4999155
Escherichia Coli	>24200	MBHT	10	MPN/100mL		19-FEB-20	R4999155
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	0.000020		0.000020	mg/L	25-FEB-20	02-MAR-20	R5012827
2-Methyl Naphthalene	0.000022		0.000020	mg/L	25-FEB-20	02-MAR-20	R5012827
Acenaphthene	<0.000020		0.000020	mg/L	25-FEB-20	02-MAR-20	R5012827
Acenaphthylene	<0.000020		0.000020	mg/L	25-FEB-20	02-MAR-20	R5012827
Anthracene	<0.000010		0.000010	mg/L	25-FEB-20	02-MAR-20	R5012827
Acridine	<0.000020		0.000020	mg/L	25-FEB-20	02-MAR-20	R5012827
Benzo(a)anthracene	<0.000010		0.000010	mg/L	25-FEB-20	02-MAR-20	R5012827
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	25-FEB-20	02-MAR-20	R5012827
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	25-FEB-20	02-MAR-20	R5012827
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	25-FEB-20	02-MAR-20	R5012827
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	25-FEB-20	02-MAR-20	R5012827
Chrysene	<0.000020		0.000020	mg/L	25-FEB-20	02-MAR-20	R5012827
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	25-FEB-20	02-MAR-20	R5012827
Fluoranthene	<0.000020		0.000020	mg/L	25-FEB-20	02-MAR-20	R5012827
Fluorene	<0.000020		0.000020	mg/L	25-FEB-20	02-MAR-20	R5012827
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	25-FEB-20	02-MAR-20	R5012827
Naphthalene	0.000051		0.000050	mg/L	25-FEB-20	02-MAR-20	R5012827
Phenanthrene	<0.000050		0.000050	mg/L	25-FEB-20	02-MAR-20	R5012827
Pyrene	<0.000010		0.000010	mg/L	25-FEB-20	02-MAR-20	R5012827
Quinoline	<0.000020		0.000020	mg/L	25-FEB-20	02-MAR-20	R5012827
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	25-FEB-20	02-MAR-20	R5012827
Surrogate: Acenaphthene d10	61.0		60-130	%	25-FEB-20	02-MAR-20	R5012827
Surrogate: Acridine d9	63.3		60-130	%	25-FEB-20	02-MAR-20	R5012827
Surrogate: Chrysene d12	62.8		60-130	%	25-FEB-20	02-MAR-20	R5012827
Surrogate: Naphthalene d8	60.4		50-130	%	25-FEB-20	02-MAR-20	R5012827
Surrogate: Phenanthrene d10	61.7		60-130	%	25-FEB-20	02-MAR-20	R5012827

* 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
L2418503-1 RANKIN INLET WWTP - EFFLUENT Sampled By: SD on 18-FEB-20 @ 10:30 Matrix: WASTE Nunavut WW Group 1							
Alkalinity, Bicarbonate Bicarbonate (HCO3)	138		1.2	mg/L		21-FEB-20	
Alkalinity, Carbonate Carbonate (CO3)	<0.60		0.60	mg/L		21-FEB-20	
Alkalinity, Hydroxide Hydroxide (OH)	<0.34		0.34	mg/L		21-FEB-20	
Alkalinity, Total (as CaCO3) Alkalinity, Total (as CaCO3)	113		1.0	mg/L		20-FEB-20	R4999364
Ammonia by colour Ammonia, Total (as N)	11.6		0.50	mg/L		21-FEB-20	R5003946
Biochemical Oxygen Demand (BOD) Biochemical Oxygen Demand	115		20	mg/L		20-FEB-20	R5010174
Carbonaceous BOD BOD Carbonaceous	109		20	mg/L		20-FEB-20	R5010174
Chloride in Water by IC Chloride (Cl)	67.2		0.50	mg/L		20-FEB-20	R4999549
Conductivity Conductivity	500		1.0	umhos/cm		20-FEB-20	R4999364
Fecal coliforms, 1:10 dilution by QT97 Fecal Coliforms	>24200	MBHT	10	MPN/100mL		19-FEB-20	R4999154
Hardness Calculated Hardness (as CaCO3)	118	HTC	0.20	mg/L		26-FEB-20	
Mercury Total Mercury (Hg)-Total	0.0000070		0.0000050	mg/L	21-FEB-20	24-FEB-20	R5003268
Nitrate in Water by IC Nitrate (as N)	0.105		0.020	mg/L		20-FEB-20	R4999549
Nitrate+Nitrite Nitrate and Nitrite as N	0.123		0.070	mg/L		21-FEB-20	
Nitrite in Water by IC Nitrite (as N)	0.017		0.010	mg/L		20-FEB-20	R4999549
Oil & Grease - Gravimetric Oil and Grease	80.0		5.0	mg/L		27-FEB-20	R5010127
Phenol (4AAP) Phenols (4AAP)	0.0059		0.0010	mg/L		21-FEB-20	R5001907
Phosphorus, Total Phosphorus (P)-Total	1.73		0.0060	mg/L		21-FEB-20	R5002918
Sulfate in Water by IC Sulfate (SO4)	34.6		0.30	mg/L		20-FEB-20	R4999549
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.134		0.0030	mg/L	24-FEB-20	24-FEB-20	R5004673
Antimony (Sb)-Total	0.00021		0.00010	mg/L	24-FEB-20	24-FEB-20	R5004673
Arsenic (As)-Total	0.00102		0.00010	mg/L	24-FEB-20	24-FEB-20	R5004673
Barium (Ba)-Total	0.0378		0.00010	mg/L	24-FEB-20	24-FEB-20	R5004673
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	24-FEB-20	24-FEB-20	R5004673
Bismuth (Bi)-Total	0.000568		0.000050	mg/L	24-FEB-20	24-FEB-20	R5004673
Boron (B)-Total	0.122		0.010	mg/L	24-FEB-20	24-FEB-20	R5004673
Cadmium (Cd)-Total	0.000108		0.0000050	mg/L	24-FEB-20	24-FEB-20	R5004673
Calcium (Ca)-Total	32.3		0.050	mg/L	24-FEB-20	24-FEB-20	R5004673
Cesium (Cs)-Total	0.000076		0.000010	mg/L	24-FEB-20	24-FEB-20	R5004673
Chromium (Cr)-Total	0.00093		0.00010	mg/L	24-FEB-20	24-FEB-20	R5004673
Cobalt (Co)-Total	0.00016		0.00010	mg/L	24-FEB-20	24-FEB-20	R5004673
Copper (Cu)-Total	0.192		0.00050	mg/L	24-FEB-20	24-FEB-20	R5004673

* 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
L2418503-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 18-FEB-20 @ 10:30							
Matrix: WASTE							
Total Metals in Water by CRC ICPMS							
Iron (Fe)-Total	0.177		0.010	mg/L	24-FEB-20	24-FEB-20	R5004673
Lead (Pb)-Total	0.00185		0.000050	mg/L	24-FEB-20	24-FEB-20	R5004673
Lithium (Li)-Total	0.0038		0.0010	mg/L	24-FEB-20	24-FEB-20	R5004673
Magnesium (Mg)-Total	9.04		0.0050	mg/L	24-FEB-20	24-FEB-20	R5004673
Manganese (Mn)-Total	0.0227		0.00010	mg/L	24-FEB-20	24-FEB-20	R5004673
Molybdenum (Mo)-Total	0.00103		0.000050	mg/L	24-FEB-20	24-FEB-20	R5004673
Nickel (Ni)-Total	0.00320		0.00050	mg/L	24-FEB-20	24-FEB-20	R5004673
Potassium (K)-Total	8.27		0.050	mg/L	24-FEB-20	24-FEB-20	R5004673
Phosphorus (P)-Total	2.44		0.030	mg/L	24-FEB-20	24-FEB-20	R5004673
Rubidium (Rb)-Total	0.00835		0.00020	mg/L	24-FEB-20	24-FEB-20	R5004673
Selenium (Se)-Total	0.000256		0.000050	mg/L	24-FEB-20	24-FEB-20	R5004673
Silicon (Si)-Total	0.34		0.10	mg/L	24-FEB-20	24-FEB-20	R5004673
Silver (Ag)-Total	0.000052		0.000010	mg/L	24-FEB-20	24-FEB-20	R5004673
Sodium (Na)-Total	44.8		0.050	mg/L	24-FEB-20	24-FEB-20	R5004673
Strontium (Sr)-Total	0.151		0.00020	mg/L	24-FEB-20	24-FEB-20	R5004673
Sulfur (S)-Total	14.2		0.50	mg/L	24-FEB-20	24-FEB-20	R5004673
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	24-FEB-20	24-FEB-20	R5004673
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	24-FEB-20	24-FEB-20	R5004673
Thorium (Th)-Total	<0.00010		0.00010	mg/L	24-FEB-20	24-FEB-20	R5004673
Tin (Sn)-Total	0.00107		0.00010	mg/L	24-FEB-20	24-FEB-20	R5004673
Titanium (Ti)-Total	0.0177		0.00030	mg/L	24-FEB-20	24-FEB-20	R5004673
Tungsten (W)-Total	<0.00010		0.00010	mg/L	24-FEB-20	24-FEB-20	R5004673
Uranium (U)-Total	0.000173		0.000010	mg/L	24-FEB-20	24-FEB-20	R5004673
Vanadium (V)-Total	<0.00050		0.00050	mg/L	24-FEB-20	24-FEB-20	R5004673
Zinc (Zn)-Total	0.0992		0.0030	mg/L	24-FEB-20	24-FEB-20	R5004673
Zirconium (Zr)-Total	0.00065		0.00020	mg/L	24-FEB-20	24-FEB-20	R5004673
Total Organic Carbon by Combustion							
Total Organic Carbon	49.2		5.0	mg/L		26-FEB-20	R5009215
Total Suspended Solids							
Total Suspended Solids	104		3.0	mg/L		25-FEB-20	R5010686
pH							
pH	7.27		0.10	pH units		20-FEB-20	R4999364

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MBHT	The APHA 30 hour hold time was exceeded for microbiological testing. Samples processed within 48 hours from time of sampling may be valid in some cases (refer to Health Canada guidance).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-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 transferred 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.			
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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
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 Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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 aqueous 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 Substrate 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 ww - 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.

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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	R4999364							
WG3279226-5 DUP		L2418503-1						
Alkalinity, Total (as CaCO ₃)		113	111		mg/L	2.1	20	20-FEB-20
WG3279226-4 LCS								
Alkalinity, Total (as CaCO ₃)			104.2		%		85-115	20-FEB-20
WG3279226-1 MB								
Alkalinity, Total (as CaCO ₃)			<1.0		mg/L		1	20-FEB-20
BOD-CBOD-WP Water								
Batch	R5010174							
WG3278355-2 LCS								
BOD Carbonaceous			99.7		%		85-115	20-FEB-20
WG3278355-1 MB								
BOD Carbonaceous			<2.0		mg/L		2	20-FEB-20
BOD-WP Water								
Batch	R5010174							
WG3278355-2 LCS								
Biochemical Oxygen Demand			99.6		%		85-115	20-FEB-20
WG3278355-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	20-FEB-20
BTEXS+F1-HSMS-WP Water								
Batch	R5005413							
WG3280451-4 DUP		L2418503-1						
Benzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	24-FEB-20
Toluene		0.0021	0.0021		mg/L	2.2	30	24-FEB-20
Ethyl benzene		0.00061	0.00064		mg/L	3.8	30	24-FEB-20
o-Xylene		0.00096	0.00100		mg/L	4.3	30	24-FEB-20
m+p-Xylenes		0.00192	0.00208		mg/L	7.8	30	24-FEB-20
F1 (C6-C10)		<0.10	<0.10	RPD-NA	mg/L	N/A	30	24-FEB-20
WG3280451-2 LCS								
Benzene			94.6		%		70-130	24-FEB-20
Toluene			88.3		%		70-130	24-FEB-20
Ethyl benzene			96.4		%		70-130	24-FEB-20
o-Xylene			107.1		%		70-130	24-FEB-20
m+p-Xylenes			102.9		%		70-130	24-FEB-20
WG3280451-3 LCS								
F1 (C6-C10)			76.9		%		70-130	24-FEB-20
WG3280451-1 MB								
Benzene			<0.00050		mg/L		0.0005	24-FEB-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTEXS+F1-HSMS-WP	Water							
Batch	R5005413							
WG3280451-1 MB								
Toluene			<0.0010		mg/L		0.001	24-FEB-20
Ethyl benzene			<0.00050		mg/L		0.0005	24-FEB-20
o-Xylene			<0.00050		mg/L		0.0005	24-FEB-20
m+p-Xylenes			<0.00040		mg/L		0.0004	24-FEB-20
F1 (C6-C10)			<0.10		mg/L		0.1	24-FEB-20
Surrogate: 4-Bromofluorobenzene (SS)			78.7		%		70-130	24-FEB-20
C-TOC-HTC-WP	Water							
Batch	R5009215							
WG3282645-2 LCS								
Total Organic Carbon			98.5		%		80-120	26-FEB-20
WG3282645-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	26-FEB-20
CL-IC-N-WP	Water							
Batch	R4999549							
WG3278804-6 LCS								
Chloride (Cl)			102.4		%		90-110	20-FEB-20
WG3278804-5 MB								
Chloride (Cl)			<0.50		mg/L		0.5	20-FEB-20
EC-WP	Water							
Batch	R4999364							
WG3279226-5 DUP		L2418503-1						
Conductivity		500	506		umhos/cm	1.2	10	20-FEB-20
WG3279226-3 LCS								
Conductivity			98.9		%		90-110	20-FEB-20
WG3279226-1 MB								
Conductivity			<1.0		umhos/cm		1	20-FEB-20
F-IC-N-WP	Water							
Batch	R4999549							
WG3278804-6 LCS								
Fluoride (F)			99.1		%		90-110	20-FEB-20
WG3278804-5 MB								
Fluoride (F)			<0.020		mg/L		0.02	20-FEB-20
F2-F4-FID-WP	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-FID-WP	Water							
Batch	R4999313							
WG3278621-2	LCS							
F2 (C10-C16)			103.0		%		70-130	20-FEB-20
F3 (C16-C34)			93.4		%		70-130	20-FEB-20
F4 (C34-C50)			91.6		%		70-130	20-FEB-20
WG3278621-1	MB							
F2 (C10-C16)			<0.10		mg/L		0.1	20-FEB-20
F3 (C16-C34)			<0.25		mg/L		0.25	20-FEB-20
F4 (C34-C50)			<0.25		mg/L		0.25	20-FEB-20
Surrogate: 2-Bromobenzotrifluoride			102.8		%		60-140	20-FEB-20
FC10-QT97-WP	Water							
Batch	R4999154							
WG3278107-2	DUP	L2418503-1						
Fecal Coliforms		>24200	>24200		MPN/100mL	0.0	65	19-FEB-20
WG3278107-1	MB							
Fecal Coliforms			<1		MPN/100mL		1	19-FEB-20
HG-T-CVAA-WP	Water							
Batch	R5003268							
WG3280790-2	LCS							
Mercury (Hg)-Total			102.0		%		80-120	24-FEB-20
WG3280790-1	MB							
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	24-FEB-20
MET-T-CCMS-WP	Water							
Batch	R5004673							
WG3279447-2	LCS							
Aluminum (Al)-Total			104.2		%		80-120	24-FEB-20
Antimony (Sb)-Total			106.1		%		80-120	24-FEB-20
Arsenic (As)-Total			100.8		%		80-120	24-FEB-20
Barium (Ba)-Total			100.3		%		80-120	24-FEB-20
Beryllium (Be)-Total			107.8		%		80-120	24-FEB-20
Bismuth (Bi)-Total			104.0		%		80-120	24-FEB-20
Boron (B)-Total			110.4		%		80-120	24-FEB-20
Cadmium (Cd)-Total			98.5		%		80-120	24-FEB-20
Calcium (Ca)-Total			102.5		%		80-120	24-FEB-20
Cesium (Cs)-Total			108.4		%		80-120	24-FEB-20
Chromium (Cr)-Total			101.5		%		80-120	24-FEB-20
Cobalt (Co)-Total			100.3		%		80-120	24-FEB-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R5004673							
WG3279447-2	LCS							
Copper (Cu)-Total			101.5		%		80-120	24-FEB-20
Iron (Fe)-Total			94.7		%		80-120	24-FEB-20
Lead (Pb)-Total			106.0		%		80-120	24-FEB-20
Lithium (Li)-Total			104.1		%		80-120	24-FEB-20
Magnesium (Mg)-Total			116.3		%		80-120	24-FEB-20
Manganese (Mn)-Total			102.6		%		80-120	24-FEB-20
Molybdenum (Mo)-Total			106.8		%		80-120	24-FEB-20
Nickel (Ni)-Total			99.2		%		80-120	24-FEB-20
Potassium (K)-Total			94.9		%		80-120	24-FEB-20
Phosphorus (P)-Total			107.8		%		80-120	24-FEB-20
Rubidium (Rb)-Total			101.9		%		80-120	24-FEB-20
Selenium (Se)-Total			105.9		%		80-120	24-FEB-20
Silicon (Si)-Total			111.4		%		80-120	24-FEB-20
Silver (Ag)-Total			103.7		%		80-120	24-FEB-20
Sodium (Na)-Total			105.9		%		80-120	24-FEB-20
Strontium (Sr)-Total			106.0		%		80-120	24-FEB-20
Sulfur (S)-Total			116.5		%		80-120	24-FEB-20
Tellurium (Te)-Total			100.0		%		80-120	24-FEB-20
Thallium (Tl)-Total			105.3		%		80-120	24-FEB-20
Thorium (Th)-Total			102.6		%		80-120	24-FEB-20
Tin (Sn)-Total			99.4		%		80-120	24-FEB-20
Titanium (Ti)-Total			97.7		%		80-120	24-FEB-20
Tungsten (W)-Total			104.8		%		80-120	24-FEB-20
Uranium (U)-Total			107.0		%		80-120	24-FEB-20
Vanadium (V)-Total			102.8		%		80-120	24-FEB-20
Zinc (Zn)-Total			99.6		%		80-120	24-FEB-20
Zirconium (Zr)-Total			99.3		%		80-120	24-FEB-20
WG3279447-1	MB							
Aluminum (Al)-Total			<0.0030		mg/L		0.003	24-FEB-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	24-FEB-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	24-FEB-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	24-FEB-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	24-FEB-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	24-FEB-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R5004673							
WG3279447-1 MB								
Boron (B)-Total			<0.010		mg/L		0.01	24-FEB-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	24-FEB-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	24-FEB-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	24-FEB-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	24-FEB-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	24-FEB-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	24-FEB-20
Iron (Fe)-Total			<0.010		mg/L		0.01	24-FEB-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	24-FEB-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	24-FEB-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	24-FEB-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	24-FEB-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	24-FEB-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	24-FEB-20
Potassium (K)-Total			<0.050		mg/L		0.05	24-FEB-20
Phosphorus (P)-Total			<0.030		mg/L		0.03	24-FEB-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	24-FEB-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	24-FEB-20
Silicon (Si)-Total			<0.10		mg/L		0.1	24-FEB-20
Silver (Ag)-Total			<0.000010		mg/L		0.00001	24-FEB-20
Sodium (Na)-Total			<0.050		mg/L		0.05	24-FEB-20
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	24-FEB-20
Sulfur (S)-Total			<0.50		mg/L		0.5	24-FEB-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	24-FEB-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	24-FEB-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	24-FEB-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	24-FEB-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	24-FEB-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	24-FEB-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	24-FEB-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	24-FEB-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	24-FEB-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	24-FEB-20
NH3-COL-WP	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-COL-WP	Water							
Batch	R5003946							
WG3280970-2 LCS								
Ammonia, Total (as N)			99.2		%		85-115	21-FEB-20
WG3280970-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	21-FEB-20
N02-IC-N-WP	Water							
Batch	R4999549							
WG3278804-6 LCS								
Nitrite (as N)			101.8		%		90-110	20-FEB-20
WG3278804-5 MB								
Nitrite (as N)			<0.010		mg/L		0.01	20-FEB-20
N03-IC-N-WP	Water							
Batch	R4999549							
WG3278804-6 LCS								
Nitrate (as N)			101.6		%		90-110	20-FEB-20
WG3278804-5 MB								
Nitrate (as N)			<0.020		mg/L		0.02	20-FEB-20
OG-GRAV-WP	Water							
Batch	R5010127							
WG3282098-2 LCS								
Oil and Grease			91.8		%		70-130	27-FEB-20
WG3282098-1 MB								
Oil and Grease			<5.0		mg/L		5	27-FEB-20
P-T-COL-WP	Water							
Batch	R5002918							
WG3278737-10 LCS								
Phosphorus (P)-Total			99.4		%		80-120	21-FEB-20
WG3278737-9 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	21-FEB-20
WG3278737-12 MS		L2418503-1						
Phosphorus (P)-Total			N/A	MS-B	%		-	21-FEB-20
PAH,PANH-WP	Water							
Batch	R5012827							
WG3285379-2 LCS								
1-Methyl Naphthalene			105.9		%		60-130	02-MAR-20
2-Methyl Naphthalene			84.2		%		60-130	02-MAR-20
Acenaphthene			97.2		%		60-130	02-MAR-20
Acenaphthylene			87.0		%		60-130	02-MAR-20

Quality Control Report

Workorder: L2418503

Report Date: 03-MAR-20

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH,PANH-WP	Water							
Batch	R5012827							
WG3285379-2	LCS							
Anthracene			82.5		%		60-130	02-MAR-20
Acridine			78.9		%		60-130	02-MAR-20
Benzo(a)anthracene			76.9		%		60-130	02-MAR-20
Benzo(a)pyrene			98.3		%		60-130	02-MAR-20
Benzo(b&j)fluoranthene			91.1		%		60-130	02-MAR-20
Benzo(g,h,i)perylene			97.9		%		60-130	02-MAR-20
Benzo(k)fluoranthene			119.6		%		60-130	02-MAR-20
Chrysene			91.9		%		60-130	02-MAR-20
Dibenzo(a,h)anthracene			85.7		%		60-130	02-MAR-20
Fluoranthene			101.7		%		60-130	02-MAR-20
Fluorene			87.7		%		60-130	02-MAR-20
Indeno(1,2,3-cd)pyrene			87.0		%		60-130	02-MAR-20
Naphthalene			106.7		%		50-130	02-MAR-20
Phenanthrene			91.8		%		60-130	02-MAR-20
Pyrene			106.1		%		60-130	02-MAR-20
Quinoline			95.9		%		60-130	02-MAR-20
WG3285379-1	MB							
1-Methyl Naphthalene			<0.000020		mg/L		0.00002	02-MAR-20
2-Methyl Naphthalene			<0.000020		mg/L		0.00002	02-MAR-20
Acenaphthene			<0.000020		mg/L		0.00002	02-MAR-20
Acenaphthylene			<0.000020		mg/L		0.00002	02-MAR-20
Anthracene			<0.000010		mg/L		0.00001	02-MAR-20
Acridine			<0.000020		mg/L		0.00002	02-MAR-20
Benzo(a)anthracene			<0.000010		mg/L		0.00001	02-MAR-20
Benzo(a)pyrene			<0.0000050		mg/L		0.000005	02-MAR-20
Benzo(b&j)fluoranthene			<0.000010		mg/L		0.00001	02-MAR-20
Benzo(g,h,i)perylene			<0.000020		mg/L		0.00002	02-MAR-20
Benzo(k)fluoranthene			<0.000010		mg/L		0.00001	02-MAR-20
Chrysene			<0.000020		mg/L		0.00002	02-MAR-20
Dibenzo(a,h)anthracene			<0.0000050		mg/L		0.000005	02-MAR-20
Fluoranthene			<0.000020		mg/L		0.00002	02-MAR-20
Fluorene			<0.000020		mg/L		0.00002	02-MAR-20
Indeno(1,2,3-cd)pyrene			<0.000010		mg/L		0.00001	02-MAR-20
Naphthalene			<0.000050		mg/L		0.00005	02-MAR-20



Quality Control Report

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH,PANH-WP	Water							
Batch	R5012827							
WG3285379-1 MB								
Phenanthrene			<0.000050		mg/L		0.00005	02-MAR-20
Pyrene			<0.000010		mg/L		0.00001	02-MAR-20
Quinoline			<0.000020		mg/L		0.00002	02-MAR-20
Surrogate: Acenaphthene d10			75.9		%		60-130	02-MAR-20
Surrogate: Acridine d9			66.5		%		60-130	02-MAR-20
Surrogate: Chrysene d12			66.8		%		60-130	02-MAR-20
Surrogate: Naphthalene d8			69.1		%		50-130	02-MAR-20
Surrogate: Phenanthrene d10			72.8		%		60-130	02-MAR-20
PH-WP	Water							
Batch	R4999364							
WG3279226-5 DUP		L2418503-1						
pH		7.27	7.27	J	pH units	0.00	0.2	20-FEB-20
WG3279226-2 LCS								
pH			7.37		pH units		7.3-7.5	20-FEB-20
PHENOLS-4AAP-WT	Water							
Batch	R5001907							
WG3279273-3 DUP		L2418503-1						
Phenols (4AAP)		0.0059	0.0057		mg/L	3.6	20	21-FEB-20
WG3279273-2 LCS								
Phenols (4AAP)			97.2		%		85-115	21-FEB-20
WG3279273-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	21-FEB-20
WG3279273-4 MS		L2418503-1						
Phenols (4AAP)			93.0		%		75-125	21-FEB-20
S04-IC-N-WP	Water							
Batch	R4999549							
WG3278804-6 LCS								
Sulfate (SO4)			103.3		%		90-110	20-FEB-20
WG3278804-5 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	20-FEB-20
SOLIDS-TOTSUS-WP	Water							
Batch	R5010686							
WG3281199-2 LCS								
Total Suspended Solids			96.6		%		85-115	25-FEB-20
WG3281199-1 MB								
Total Suspended Solids			<2.0		mg/L		2	25-FEB-20



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Report Date: 03-MAR-20

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TC,EC10-QT97-WP Water								
Batch R4999155								
WG3278930-2 DUP L2418503-1								
Total Coliforms		>24200	>24200		MPN/100mL	0.0	65	19-FEB-20
Escherichia Coli		>24200	>24200		MPN/100mL	0.0	65	19-FEB-20
WG3278930-1 MB								
Total Coliforms			<1		MPN/100mL		1	19-FEB-20
Escherichia Coli			<1		MPN/100mL		1	19-FEB-20

Quality Control Report

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Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH	1	18-FEB-20 10:30	20-FEB-20 12:00	0.25	49	hours	EHTR-FM
Bacteriological Tests							
Fecal coliforms, 1:10 dilution by QT97	1	18-FEB-20 10:30	19-FEB-20 18:00	30	31	hours	EHTL
Total and E. coli, 1:10 dilution by QT97	1	18-FEB-20 10:30	19-FEB-20 18:00	30	31	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 L2418503 were received on 19-FEB-20 13:20.

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.

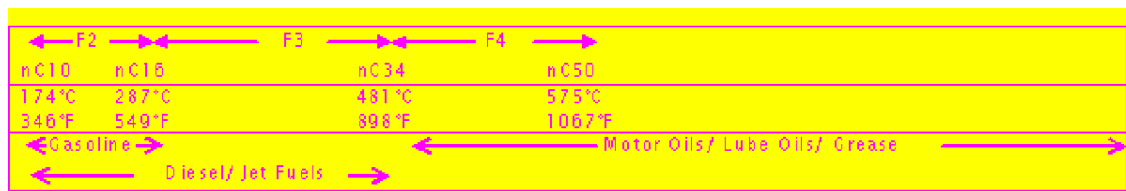
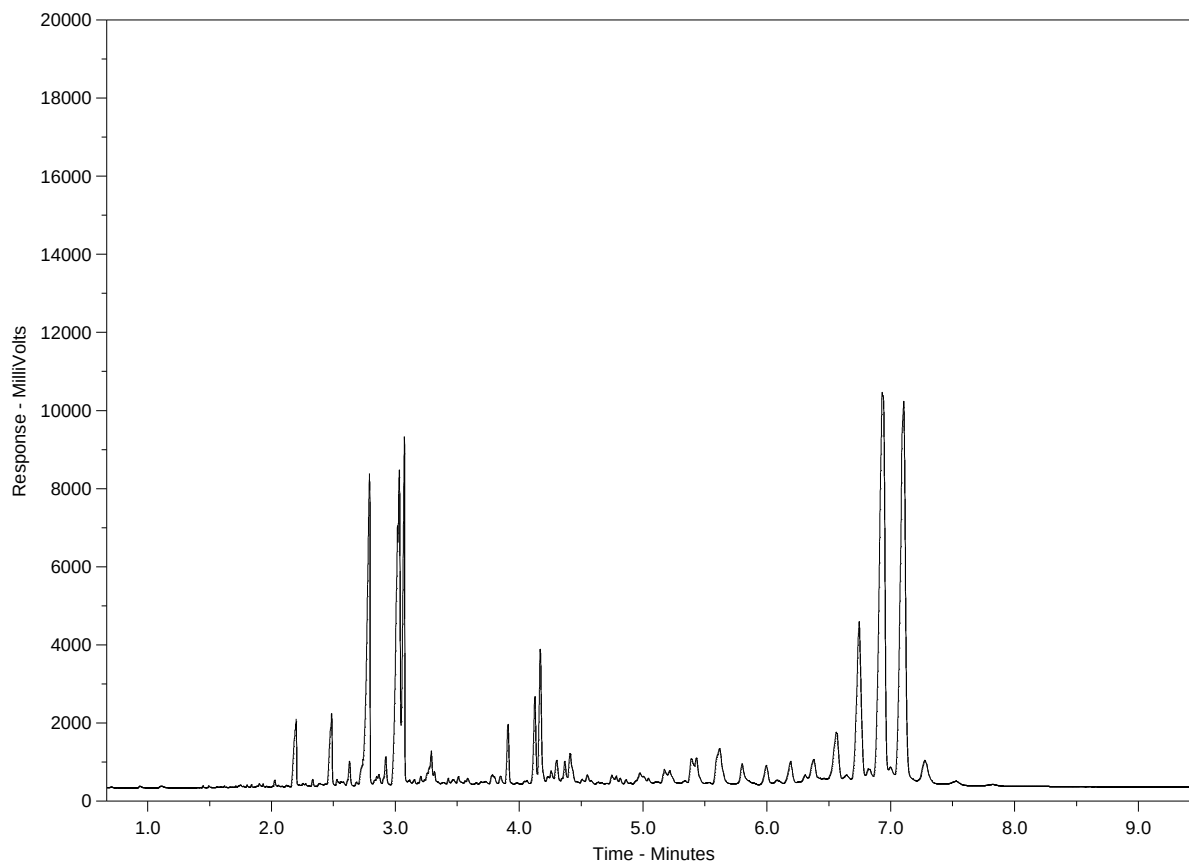
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide 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: L2418503-1
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.



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

Date Received: 12-MAR-20
Report Date: 23-MAR-20 15:59 (MT)
Version: FINAL

Client Phone: 867-645-8155

Certificate of Analysis

Lab Work Order #: L2427160

Project P.O. #: NOT SUBMITTED

Job Reference: RANKIN INLET WWTP - MONTHLY EFFLUENT

C of C Numbers:

Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2427160-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 11-MAR-20 @ 10:30							
Matrix: WASTE							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		16-MAR-20	R5029047
Toluene	<0.0010		0.0010	mg/L		16-MAR-20	R5029047
Ethyl benzene	<0.00050		0.00050	mg/L		16-MAR-20	R5029047
o-Xylene	<0.00050		0.00050	mg/L		16-MAR-20	R5029047
m+p-Xylenes	<0.00040		0.00040	mg/L		16-MAR-20	R5029047
F1 (C6-C10)	<0.10		0.10	mg/L		16-MAR-20	R5029047
Surrogate: 4-Bromofluorobenzene (SS)	88.0		70-130	%		16-MAR-20	R5029047
CCME PHC F2-F4 in Water							
F2 (C10-C16)	1.03		0.10	mg/L	13-MAR-20	13-MAR-20	R5025959
F3 (C16-C34)	12.7		0.25	mg/L	13-MAR-20	13-MAR-20	R5025959
F4 (C34-C50)	5.75		0.25	mg/L	13-MAR-20	13-MAR-20	R5025959
Surrogate: 2-Bromobenzotrifluoride	91.5		60-140	%	13-MAR-20	13-MAR-20	R5025959
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		23-MAR-20	
F2-Naphth	1.03		0.10	mg/L		23-MAR-20	
F3-PAH	12.7		0.25	mg/L		23-MAR-20	
Total Hydrocarbons (C6-C50)	19.5		0.38	mg/L		23-MAR-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		18-MAR-20	
Miscellaneous Parameters							
Fluoride (F)	0.227		0.020	mg/L		12-MAR-20	R5025983
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	>24200		10	MPN/100mL		12-MAR-20	R5024060
Escherichia Coli	>24200		10	MPN/100mL		12-MAR-20	R5024060
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	20-MAR-20	23-MAR-20	R5034567
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	20-MAR-20	23-MAR-20	R5034567
Acenaphthene	<0.000020		0.000020	mg/L	20-MAR-20	23-MAR-20	R5034567
Acenaphthylene	<0.000020		0.000020	mg/L	20-MAR-20	23-MAR-20	R5034567
Anthracene	<0.000010		0.000010	mg/L	20-MAR-20	23-MAR-20	R5034567
Acridine	<0.000020		0.000020	mg/L	20-MAR-20	23-MAR-20	R5034567
Benzo(a)anthracene	<0.000010		0.000010	mg/L	20-MAR-20	23-MAR-20	R5034567
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	20-MAR-20	23-MAR-20	R5034567
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	20-MAR-20	23-MAR-20	R5034567
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	20-MAR-20	23-MAR-20	R5034567
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	20-MAR-20	23-MAR-20	R5034567
Chrysene	<0.000020		0.000020	mg/L	20-MAR-20	23-MAR-20	R5034567
Dibenzo(a,h)anthracene	<0.000010		0.000010	mg/L	20-MAR-20	23-MAR-20	R5034567
Fluoranthene	<0.000020		0.000020	mg/L	20-MAR-20	23-MAR-20	R5034567
Fluorene	<0.000020		0.000020	mg/L	20-MAR-20	23-MAR-20	R5034567
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	20-MAR-20	23-MAR-20	R5034567
Naphthalene	<0.000050		0.000050	mg/L	20-MAR-20	23-MAR-20	R5034567
Phenanthrene	<0.000050		0.000050	mg/L	20-MAR-20	23-MAR-20	R5034567
Pyrene	<0.000010		0.000010	mg/L	20-MAR-20	23-MAR-20	R5034567
Quinoline	0.000061		0.000020	mg/L	20-MAR-20	23-MAR-20	R5034567
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	20-MAR-20	23-MAR-20	R5034567
Surrogate: Acenaphthene d10	87.2		60-130	%	20-MAR-20	23-MAR-20	R5034567
Surrogate: Acridine d9	75.2		60-130	%	20-MAR-20	23-MAR-20	R5034567
Surrogate: Chrysene d12	78.3		60-130	%	20-MAR-20	23-MAR-20	R5034567
Surrogate: Naphthalene d8	95.9		50-130	%	20-MAR-20	23-MAR-20	R5034567
Surrogate: Phenanthrene d10	87.1		60-130	%	20-MAR-20	23-MAR-20	R5034567

* 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
L2427160-1 RANKIN INLET WWTP - EFFLUENT Sampled By: SD on 11-MAR-20 @ 10:30 Matrix: WASTE Nunavut WW Group 1							
Alkalinity, Bicarbonate Bicarbonate (HCO3)	158		1.2	mg/L		13-MAR-20	
Alkalinity, Carbonate Carbonate (CO3)	<0.60		0.60	mg/L		13-MAR-20	
Alkalinity, Hydroxide Hydroxide (OH)	<0.34		0.34	mg/L		13-MAR-20	
Alkalinity, Total (as CaCO3) Alkalinity, Total (as CaCO3)	129		1.0	mg/L		12-MAR-20	R5024495
Ammonia by colour Ammonia, Total (as N)	9.9		1.0	mg/L		17-MAR-20	R5031648
Biochemical Oxygen Demand (BOD) Biochemical Oxygen Demand	148		50	mg/L		12-MAR-20	R5029789
Carbonaceous BOD BOD Carbonaceous	177		50	mg/L		12-MAR-20	R5029789
Chloride in Water by IC Chloride (Cl)	75.6		0.50	mg/L		12-MAR-20	R5025983
Conductivity Conductivity	575		1.0	umhos/cm		12-MAR-20	R5024495
Fecal coliforms, 1:10 dilution by QT97 Fecal Coliforms	>24200		10	MPN/100mL		12-MAR-20	R5024090
Hardness Calculated Hardness (as CaCO3)	128	HTC	0.20	mg/L		23-MAR-20	
Mercury Total Mercury (Hg)-Total	0.0000120		0.0000050	mg/L	19-MAR-20	20-MAR-20	R5033394
Nitrate in Water by IC Nitrate (as N)	<0.020		0.020	mg/L		12-MAR-20	R5025983
Nitrate+Nitrite Nitrate and Nitrite as N	<0.070		0.070	mg/L		17-MAR-20	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		12-MAR-20	R5025983
Oil & Grease - Gravimetric Oil and Grease	30.4		5.0	mg/L		16-MAR-20	R5027786
Phenol (4AAP) Phenols (4AAP)	0.0123	DLM	0.0050	mg/L		17-MAR-20	R5028831
Phosphorus, Total Phosphorus (P)-Total	2.86		0.030	mg/L		18-MAR-20	R5029606
Sulfate in Water by IC Sulfate (SO4)	37.2		0.30	mg/L		12-MAR-20	R5025983
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.203		0.0030	mg/L	20-MAR-20	20-MAR-20	R5033896
Antimony (Sb)-Total	0.00025		0.00010	mg/L	20-MAR-20	20-MAR-20	R5033896
Arsenic (As)-Total	0.00104		0.00010	mg/L	20-MAR-20	20-MAR-20	R5033896
Barium (Ba)-Total	0.0411		0.00010	mg/L	20-MAR-20	20-MAR-20	R5033896
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	20-MAR-20	20-MAR-20	R5033896
Bismuth (Bi)-Total	0.00379		0.000050	mg/L	20-MAR-20	20-MAR-20	R5033896
Boron (B)-Total	0.141		0.010	mg/L	20-MAR-20	20-MAR-20	R5033896
Cadmium (Cd)-Total	0.0000791		0.0000050	mg/L	20-MAR-20	20-MAR-20	R5033896
Calcium (Ca)-Total	36.3		0.050	mg/L	20-MAR-20	20-MAR-20	R5033896
Cesium (Cs)-Total	0.000086		0.000010	mg/L	20-MAR-20	20-MAR-20	R5033896
Chromium (Cr)-Total	0.00167		0.00010	mg/L	20-MAR-20	20-MAR-20	R5033896
Cobalt (Co)-Total	0.00026		0.00010	mg/L	20-MAR-20	20-MAR-20	R5033896
Copper (Cu)-Total	0.264		0.00050	mg/L	20-MAR-20	20-MAR-20	R5033896

* 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
L2427160-1 RANKIN INLET WWTP - EFFLUENT Sampled By: SD on 11-MAR-20 @ 10:30 Matrix: WASTE							
Total Metals in Water by CRC ICPMS							
Iron (Fe)-Total	0.745		0.010	mg/L	20-MAR-20	20-MAR-20	R5033896
Lead (Pb)-Total	0.00161		0.000050	mg/L	20-MAR-20	20-MAR-20	R5033896
Lithium (Li)-Total	0.0040		0.0010	mg/L	20-MAR-20	20-MAR-20	R5033896
Magnesium (Mg)-Total	8.94		0.0050	mg/L	20-MAR-20	20-MAR-20	R5033896
Manganese (Mn)-Total	0.0334		0.00010	mg/L	20-MAR-20	20-MAR-20	R5033896
Molybdenum (Mo)-Total	0.00143		0.000050	mg/L	20-MAR-20	20-MAR-20	R5033896
Nickel (Ni)-Total	0.00414		0.00050	mg/L	20-MAR-20	20-MAR-20	R5033896
Potassium (K)-Total	10.3		0.050	mg/L	20-MAR-20	20-MAR-20	R5033896
Phosphorus (P)-Total	3.38		0.030	mg/L	20-MAR-20	20-MAR-20	R5033896
Rubidium (Rb)-Total	0.0114		0.00020	mg/L	20-MAR-20	20-MAR-20	R5033896
Selenium (Se)-Total	0.000213		0.000050	mg/L	20-MAR-20	20-MAR-20	R5033896
Silicon (Si)-Total	0.53		0.10	mg/L	20-MAR-20	20-MAR-20	R5033896
Silver (Ag)-Total	0.000067		0.000010	mg/L	20-MAR-20	20-MAR-20	R5033896
Sodium (Na)-Total	49.4		0.050	mg/L	20-MAR-20	20-MAR-20	R5033896
Strontium (Sr)-Total	0.181		0.00020	mg/L	20-MAR-20	20-MAR-20	R5033896
Sulfur (S)-Total	15.8		0.50	mg/L	20-MAR-20	20-MAR-20	R5033896
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	20-MAR-20	20-MAR-20	R5033896
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	20-MAR-20	20-MAR-20	R5033896
Thorium (Th)-Total	<0.00010		0.00010	mg/L	20-MAR-20	20-MAR-20	R5033896
Tin (Sn)-Total	0.00085		0.00010	mg/L	20-MAR-20	20-MAR-20	R5033896
Titanium (Ti)-Total	0.00212		0.00030	mg/L	20-MAR-20	20-MAR-20	R5033896
Tungsten (W)-Total	<0.00010		0.00010	mg/L	20-MAR-20	20-MAR-20	R5033896
Uranium (U)-Total	0.000190		0.000010	mg/L	20-MAR-20	20-MAR-20	R5033896
Vanadium (V)-Total	<0.00050		0.00050	mg/L	20-MAR-20	20-MAR-20	R5033896
Zinc (Zn)-Total	0.114		0.0030	mg/L	20-MAR-20	20-MAR-20	R5033896
Zirconium (Zr)-Total	0.00147		0.00020	mg/L	20-MAR-20	20-MAR-20	R5033896
Total Organic Carbon by Combustion							
Total Organic Carbon	75.2		5.0	mg/L		19-MAR-20	R5032952
Total Suspended Solids							
Total Suspended Solids	88.4		6.0	mg/L		18-MAR-20	R5033937
pH							
pH	7.20		0.10	pH units		12-MAR-20	R5024495

* 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.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-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 transferred 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 aqueous 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 Substrate 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

Workorder: L2427160

Report Date: 23-MAR-20

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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	R5024495							
WG3291879-14 LCS								
Alkalinity, Total (as CaCO ₃)			105.4		%		85-115	12-MAR-20
WG3291879-11 MB								
Alkalinity, Total (as CaCO ₃)			<1.0		mg/L		1	12-MAR-20
BOD-CBOD-WP	Water							
Batch	R5029789							
WG3291076-2 LCS								
BOD Carbonaceous			98.9		%		85-115	12-MAR-20
WG3291076-1 MB								
BOD Carbonaceous			<2.0		mg/L		2	12-MAR-20
BOD-WP	Water							
Batch	R5029789							
WG3291076-2 LCS								
Biochemical Oxygen Demand			103.1		%		85-115	12-MAR-20
WG3291076-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	12-MAR-20
BTEXS+F1-HSMS-WP	Water							
Batch	R5029047							
WG3293214-2 LCS								
Benzene			98.7		%		70-130	16-MAR-20
Toluene			94.8		%		70-130	16-MAR-20
Ethyl benzene			104.6		%		70-130	16-MAR-20
o-Xylene			109.9		%		70-130	16-MAR-20
m+p-Xylenes			112.2		%		70-130	16-MAR-20
WG3293214-3 LCS								
F1 (C6-C10)			119.3		%		70-130	16-MAR-20
WG3293214-1 MB								
Benzene			<0.00050		mg/L		0.0005	16-MAR-20
Toluene			<0.0010		mg/L		0.001	16-MAR-20
Ethyl benzene			<0.00050		mg/L		0.0005	16-MAR-20
o-Xylene			<0.00050		mg/L		0.0005	16-MAR-20
m+p-Xylenes			<0.00040		mg/L		0.0004	16-MAR-20
F1 (C6-C10)			<0.10		mg/L		0.1	16-MAR-20
Surrogate: 4-Bromofluorobenzene (SS)			88.0		%		70-130	16-MAR-20
C-TOC-HTC-WP	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-TOC-HTC-WP	Water							
Batch	R5032952							
WG3295862-3 DUP		L2427160-1						
Total Organic Carbon		75.2	84.2		mg/L	11	20	19-MAR-20
WG3295862-2 LCS								
Total Organic Carbon			101.6		%		80-120	19-MAR-20
WG3295862-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	19-MAR-20
CL-IC-N-WP	Water							
Batch	R5025983							
WG3291308-6 LCS								
Chloride (Cl)			97.6		%		90-110	12-MAR-20
WG3291308-5 MB								
Chloride (Cl)			<0.50		mg/L		0.5	12-MAR-20
EC-WP	Water							
Batch	R5024495							
WG3291879-13 LCS								
Conductivity			98.6		%		90-110	12-MAR-20
WG3291879-11 MB								
Conductivity			<1.0		umhos/cm		1	12-MAR-20
F-IC-N-WP	Water							
Batch	R5025983							
WG3291308-6 LCS								
Fluoride (F)			98.4		%		90-110	12-MAR-20
WG3291308-5 MB								
Fluoride (F)			<0.020		mg/L		0.02	12-MAR-20
F2-F4-FID-WP	Water							
Batch	R5025959							
WG3291944-2 LCS								
F2 (C10-C16)			96.7		%		70-130	13-MAR-20
F3 (C16-C34)			95.0		%		70-130	13-MAR-20
F4 (C34-C50)			101.4		%		70-130	13-MAR-20
WG3291944-1 MB								
F2 (C10-C16)			<0.10		mg/L		0.1	13-MAR-20
F3 (C16-C34)			<0.25		mg/L		0.25	13-MAR-20
F4 (C34-C50)			<0.25		mg/L		0.25	13-MAR-20
Surrogate: 2-Bromobenzotrifluoride			90.7		%		60-140	13-MAR-20
FC10-QT97-WP	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
FC10-QT97-WP	Water							
Batch	R5024090							
WG3291294-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	12-MAR-20
HG-T-CVAA-WP	Water							
Batch	R5033394							
WG3296333-2 LCS								
Mercury (Hg)-Total			100.0		%		80-120	20-MAR-20
WG3296333-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	20-MAR-20
MET-T-CCMS-WP	Water							
Batch	R5033896							
WG3295281-2 LCS								
Aluminum (Al)-Total			108.1		%		80-120	20-MAR-20
Antimony (Sb)-Total			104.0		%		80-120	20-MAR-20
Arsenic (As)-Total			107.7		%		80-120	20-MAR-20
Barium (Ba)-Total			106.6		%		80-120	20-MAR-20
Beryllium (Be)-Total			104.2		%		80-120	20-MAR-20
Bismuth (Bi)-Total			105.9		%		80-120	20-MAR-20
Boron (B)-Total			104.5		%		80-120	20-MAR-20
Cadmium (Cd)-Total			109.1		%		80-120	20-MAR-20
Calcium (Ca)-Total			106.2		%		80-120	20-MAR-20
Cesium (Cs)-Total			101.4		%		80-120	20-MAR-20
Chromium (Cr)-Total			108.7		%		80-120	20-MAR-20
Cobalt (Co)-Total			107.9		%		80-120	20-MAR-20
Copper (Cu)-Total			107.4		%		80-120	20-MAR-20
Iron (Fe)-Total			101.4		%		80-120	20-MAR-20
Lead (Pb)-Total			107.8		%		80-120	20-MAR-20
Lithium (Li)-Total			103.6		%		80-120	20-MAR-20
Magnesium (Mg)-Total			107.8		%		80-120	20-MAR-20
Manganese (Mn)-Total			105.2		%		80-120	20-MAR-20
Molybdenum (Mo)-Total			105.3		%		80-120	20-MAR-20
Nickel (Ni)-Total			106.9		%		80-120	20-MAR-20
Potassium (K)-Total			108.0		%		80-120	20-MAR-20
Phosphorus (P)-Total			117.1		%		80-120	20-MAR-20
Rubidium (Rb)-Total			105.0		%		80-120	20-MAR-20
Selenium (Se)-Total			107.4		%		80-120	20-MAR-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R5033896							
WG3295281-2	LCS							
Silicon (Si)-Total			105.8		%		80-120	20-MAR-20
Silver (Ag)-Total			104.3		%		80-120	20-MAR-20
Sodium (Na)-Total			106.6		%		80-120	20-MAR-20
Strontium (Sr)-Total			111.1		%		80-120	20-MAR-20
Sulfur (S)-Total			100.2		%		80-120	20-MAR-20
Tellurium (Te)-Total			98.5		%		80-120	20-MAR-20
Thallium (Tl)-Total			106.8		%		80-120	20-MAR-20
Thorium (Th)-Total			107.7		%		80-120	20-MAR-20
Tin (Sn)-Total			103.2		%		80-120	20-MAR-20
Titanium (Ti)-Total			100.7		%		80-120	20-MAR-20
Tungsten (W)-Total			107.4		%		80-120	20-MAR-20
Uranium (U)-Total			106.6		%		80-120	20-MAR-20
Vanadium (V)-Total			109.9		%		80-120	20-MAR-20
Zinc (Zn)-Total			103.7		%		80-120	20-MAR-20
Zirconium (Zr)-Total			105.8		%		80-120	20-MAR-20
WG3295281-1	MB							
Aluminum (Al)-Total			<0.0030		mg/L		0.003	20-MAR-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	20-MAR-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	20-MAR-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	20-MAR-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	20-MAR-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	20-MAR-20
Boron (B)-Total			<0.010		mg/L		0.01	20-MAR-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	20-MAR-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	20-MAR-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	20-MAR-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	20-MAR-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	20-MAR-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	20-MAR-20
Iron (Fe)-Total			<0.010		mg/L		0.01	20-MAR-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	20-MAR-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	20-MAR-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	20-MAR-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	20-MAR-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R5033896							
WG3295281-1 MB								
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	20-MAR-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	20-MAR-20
Potassium (K)-Total			<0.050		mg/L		0.05	20-MAR-20
Phosphorus (P)-Total			<0.030		mg/L		0.03	20-MAR-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	20-MAR-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	20-MAR-20
Silicon (Si)-Total			<0.10		mg/L		0.1	20-MAR-20
Silver (Ag)-Total			<0.000010		mg/L		0.00001	20-MAR-20
Sodium (Na)-Total			<0.050		mg/L		0.05	20-MAR-20
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	20-MAR-20
Sulfur (S)-Total			<0.50		mg/L		0.5	20-MAR-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	20-MAR-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	20-MAR-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	20-MAR-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	20-MAR-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	20-MAR-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	20-MAR-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	20-MAR-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	20-MAR-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	20-MAR-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	20-MAR-20
NH3-COL-WP	Water							
Batch	R5031648							
WG3295143-2 LCS								
Ammonia, Total (as N)			101.8		%		85-115	17-MAR-20
WG3295143-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	17-MAR-20
N02-IC-N-WP	Water							
Batch	R5025983							
WG3291308-6 LCS								
Nitrite (as N)			100.2		%		90-110	12-MAR-20
WG3291308-5 MB								
Nitrite (as N)			<0.010		mg/L		0.01	12-MAR-20
N03-IC-N-WP	Water							



Quality Control Report

Workorder: L2427160

Report Date: 23-MAR-20

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
N03-IC-N-WP	Water							
Batch	R5025983							
WG3291308-6	LCS							
Nitrate (as N)			97.6		%		90-110	12-MAR-20
WG3291308-5	MB							
Nitrate (as N)			<0.020		mg/L		0.02	12-MAR-20
OG-GRAV-WP	Water							
Batch	R5027786							
WG3292558-2	LCS							
Oil and Grease			81.0		%		70-130	16-MAR-20
WG3292558-1	MB							
Oil and Grease			<5.0		mg/L		5	16-MAR-20
P-T-COL-WP	Water							
Batch	R5029606							
WG3294079-2	LCS							
Phosphorus (P)-Total			98.3		%		80-120	18-MAR-20
WG3294079-1	MB							
Phosphorus (P)-Total			<0.0030		mg/L		0.003	18-MAR-20
PAH,PANH-WP	Water							
Batch	R5034567							
WG3297146-2	LCS							
1-Methyl Naphthalene			90.6		%		60-130	23-MAR-20
2-Methyl Naphthalene			85.5		%		60-130	23-MAR-20
Acenaphthene			92.2		%		60-130	23-MAR-20
Acenaphthylene			89.0		%		60-130	23-MAR-20
Anthracene			82.0		%		60-130	23-MAR-20
Acridine			78.1		%		60-130	23-MAR-20
Benzo(a)anthracene			72.1		%		60-130	23-MAR-20
Benzo(a)pyrene			94.3		%		60-130	23-MAR-20
Benzo(b&j)fluoranthene			106.9		%		60-130	23-MAR-20
Benzo(g,h,i)perylene			93.8		%		60-130	23-MAR-20
Benzo(k)fluoranthene			114.8		%		60-130	23-MAR-20
Chrysene			75.3		%		60-130	23-MAR-20
Dibenzo(a,h)anthracene			78.4		%		60-130	23-MAR-20
Fluoranthene			98.3		%		60-130	23-MAR-20
Fluorene			88.7		%		60-130	23-MAR-20
Indeno(1,2,3-cd)pyrene			80.9		%		60-130	23-MAR-20
Naphthalene			90.8		%		50-130	23-MAR-20



Quality Control Report

Workorder: L2427160

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH,PANH-WP	Water							
Batch	R5034567							
WG3297146-2	LCS							
Phenanthrene			93.2		%		60-130	23-MAR-20
Pyrene			95.8		%		60-130	23-MAR-20
Quinoline			98.5		%		60-130	23-MAR-20
WG3297146-1	MB							
1-Methyl Naphthalene			<0.000020		mg/L		0.00002	23-MAR-20
2-Methyl Naphthalene			<0.000020		mg/L		0.00002	23-MAR-20
Acenaphthene			<0.000020		mg/L		0.00002	23-MAR-20
Acenaphthylene			<0.000020		mg/L		0.00002	23-MAR-20
Anthracene			<0.000010		mg/L		0.00001	23-MAR-20
Acridine			<0.000020		mg/L		0.00002	23-MAR-20
Benzo(a)anthracene			<0.000010		mg/L		0.00001	23-MAR-20
Benzo(a)pyrene			<0.000005C		mg/L		0.000005	23-MAR-20
Benzo(b&j)fluoranthene			<0.000010		mg/L		0.00001	23-MAR-20
Benzo(g,h,i)perylene			<0.000020		mg/L		0.00002	23-MAR-20
Benzo(k)fluoranthene			<0.000010		mg/L		0.00001	23-MAR-20
Chrysene			<0.000020		mg/L		0.00002	23-MAR-20
Dibenzo(a,h)anthracene			<0.000005C		mg/L		0.000005	23-MAR-20
Fluoranthene			<0.000020		mg/L		0.00002	23-MAR-20
Fluorene			<0.000020		mg/L		0.00002	23-MAR-20
Indeno(1,2,3-cd)pyrene			<0.000010		mg/L		0.00001	23-MAR-20
Naphthalene			<0.000050		mg/L		0.00005	23-MAR-20
Phenanthrene			<0.000050		mg/L		0.00005	23-MAR-20
Pyrene			<0.000010		mg/L		0.00001	23-MAR-20
Quinoline			<0.000020		mg/L		0.00002	23-MAR-20
Surrogate: Acenaphthene d10			85.6		%		60-130	23-MAR-20
Surrogate: Acridine d9			75.0		%		60-130	23-MAR-20
Surrogate: Chrysene d12			61.0		%		60-130	23-MAR-20
Surrogate: Naphthalene d8			76.4		%		50-130	23-MAR-20
Surrogate: Phenanthrene d10			86.6		%		60-130	23-MAR-20
PH-WP	Water							
Batch	R5024495							
WG3291879-12	LCS							
pH			7.38		pH units		7.3-7.5	12-MAR-20
PHENOLS-4AAP-WT	Water							



Quality Control Report

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PHENOLS-4AAP-WT	Water							
Batch	R5028831							
WG3293353-2	LCS							
Phenols (4AAP)			100.0		%		85-115	17-MAR-20
WG3293353-1	MB							
Phenols (4AAP)			<0.0010		mg/L		0.001	17-MAR-20
S04-IC-N-WP	Water							
Batch	R5025983							
WG3291308-6	LCS							
Sulfate (SO4)			98.4		%		90-110	12-MAR-20
WG3291308-5	MB							
Sulfate (SO4)			<0.30		mg/L		0.3	12-MAR-20
SOLIDS-TOTSUS-WP	Water							
Batch	R5033937							
WG3294366-2	LCS							
Total Suspended Solids			104.0		%		85-115	18-MAR-20
WG3294366-1	MB							
Total Suspended Solids			<2.0		mg/L		2	18-MAR-20
TC,EC10-QT97-WP	Water							
Batch	R5024060							
WG3291302-2	DUP	L2427160-1						
Total Coliforms		>24200	>24200		MPN/100mL	0.0	65	12-MAR-20
Escherichia Coli		>24200	>24200		MPN/100mL	0.0	65	12-MAR-20
WG3291302-1	MB							
Total Coliforms			<1		MPN/100mL		1	12-MAR-20
Escherichia Coli			<1		MPN/100mL		1	12-MAR-20

Quality Control Report

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Legend:

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

Quality Control Report

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH	1	11-MAR-20 10:30	12-MAR-20 12:00	0.25	25	hours	EHTR-FM

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 L2427160 were received on 12-MAR-20 11:10.

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.

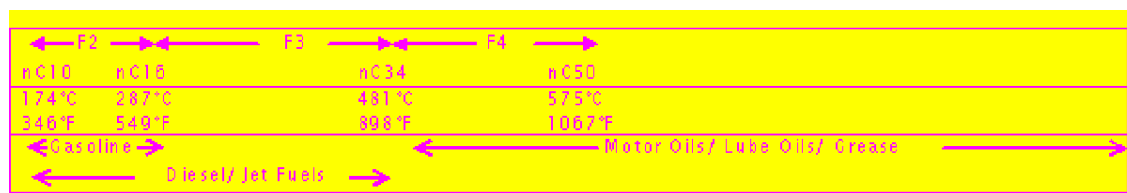
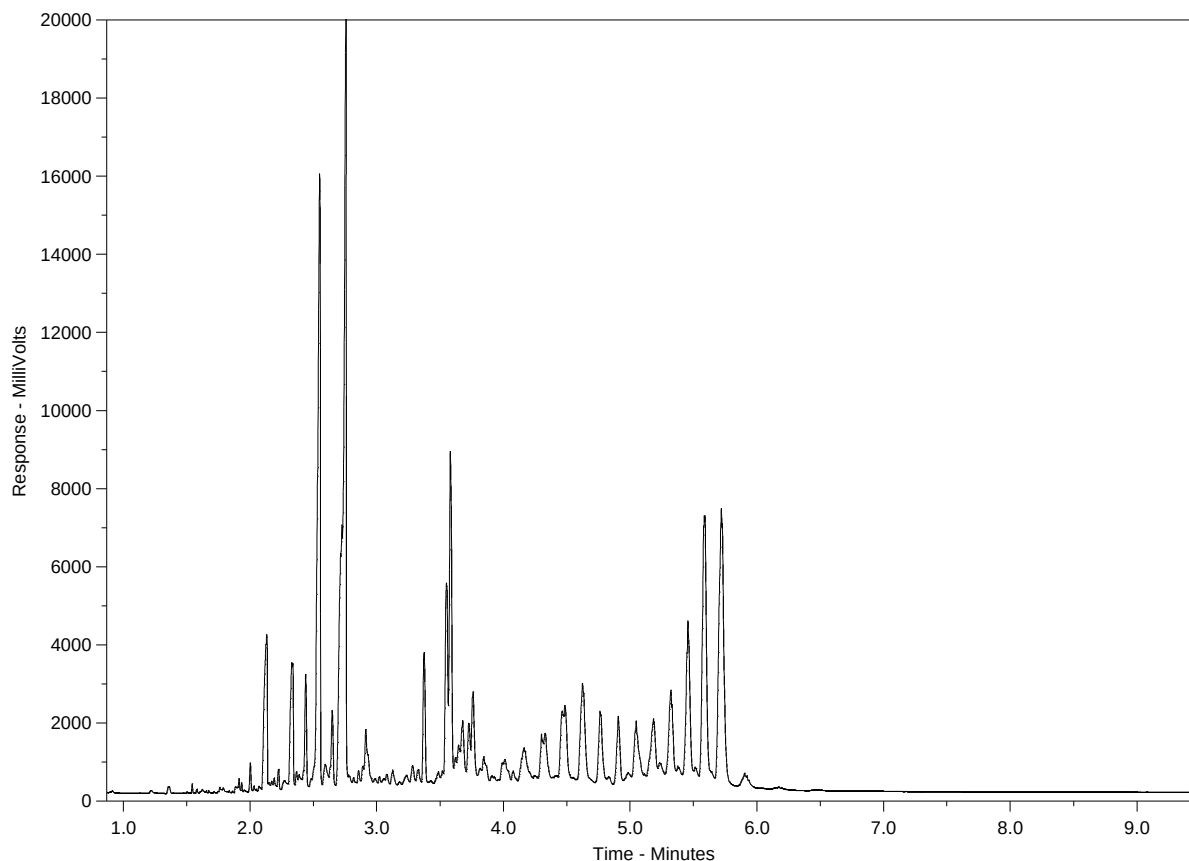
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide 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: L2427160-1
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.

Report To			Service Requested (Rush for routine analysis subject to availability)		
Company: Nunavut CGS - Rankin Inlet (W8133)			☒ Standard ☐ Other ☒ PDF ☐ Excel ☐ Digital ☐ Fax		
Contact: SIMON DOIRON			☐ Regular (Standard Turnaround Times - Business Days) ☐ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT ☐ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT ☐ Same Day or Weekend Emergency - Contact ALS to Confirm TAT		
Address: Box 490			Email 1: sdoliron@gov.nu.ca		
Rankin Inlet, NU, X0C 0G0			Email 2: scollins@gov.nu.ca		
Phone: 867-645-8155 Cell#:			Email 3: mlusty@gov.nu.ca		
Invoice To Same as Report? ☒ Yes ☐ No Hardcopy of Invoice with Report? ☐ Yes ☐ No			Analysis Request Please indicate below Filtered, Preserved or both (F, P, F/P)		
Company:			Client / Project Information		
Contact:			Job #: Rankin Inlet WWTP- Monthly Effluent		
Address:			PO / AFE:		
Phone:			LSD:		
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	Number of Containers
	Rankin Inlet WWTP - Effluent	Mar 11/20	10:30 Am	Waste	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: Bill Ross	Date (dd-mm-yy) Mar 11/20	Time (hh-mm) 10:30am	Received by: 	Date MAR 12 2020	Temperature: 7.3 °C
				Verified by: 	Date: MAR 12 2020
				Time: 1110	Observations: Yes / No If Yes add SIF



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

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 Biddell, B.Sc.Ag
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 1329 Niakwa Road East, Unit 12, Winnipeg, MB R2J 3T4 Canada | Phone: +1 204 255 9720 | Fax: +1 204 255 9721
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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: microbiological test results 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.

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 transferred 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**
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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
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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
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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
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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)
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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.)
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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
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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
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NO2-IC-N-WP	Water	Nitrite in Water by IC	EPA 300.1 (mod)
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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)
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Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

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

Workorder: L2439226

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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 CaCO ₃)		127	126		mg/L	0.2	20	24-APR-20
WG3313336-4 LCS								
Alkalinity, Total (as CaCO ₃)			101.7		%		85-115	24-APR-20
WG3313336-1 MB								
Alkalinity, Total (as CaCO ₃)			<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



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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							



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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

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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

Workorder: L2439226

Report Date: 29-APR-20

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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			<0.0000050		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

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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

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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			<0.000005C		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			<0.000005C		mg/L		0.000005	27-APR-20



Quality Control Report

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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
S04-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								



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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

Quality Control Report

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Legend:

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

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

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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.

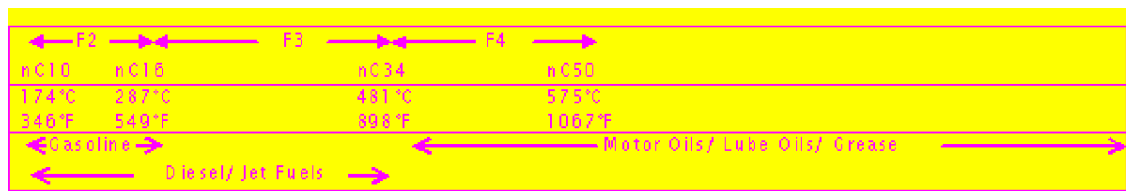
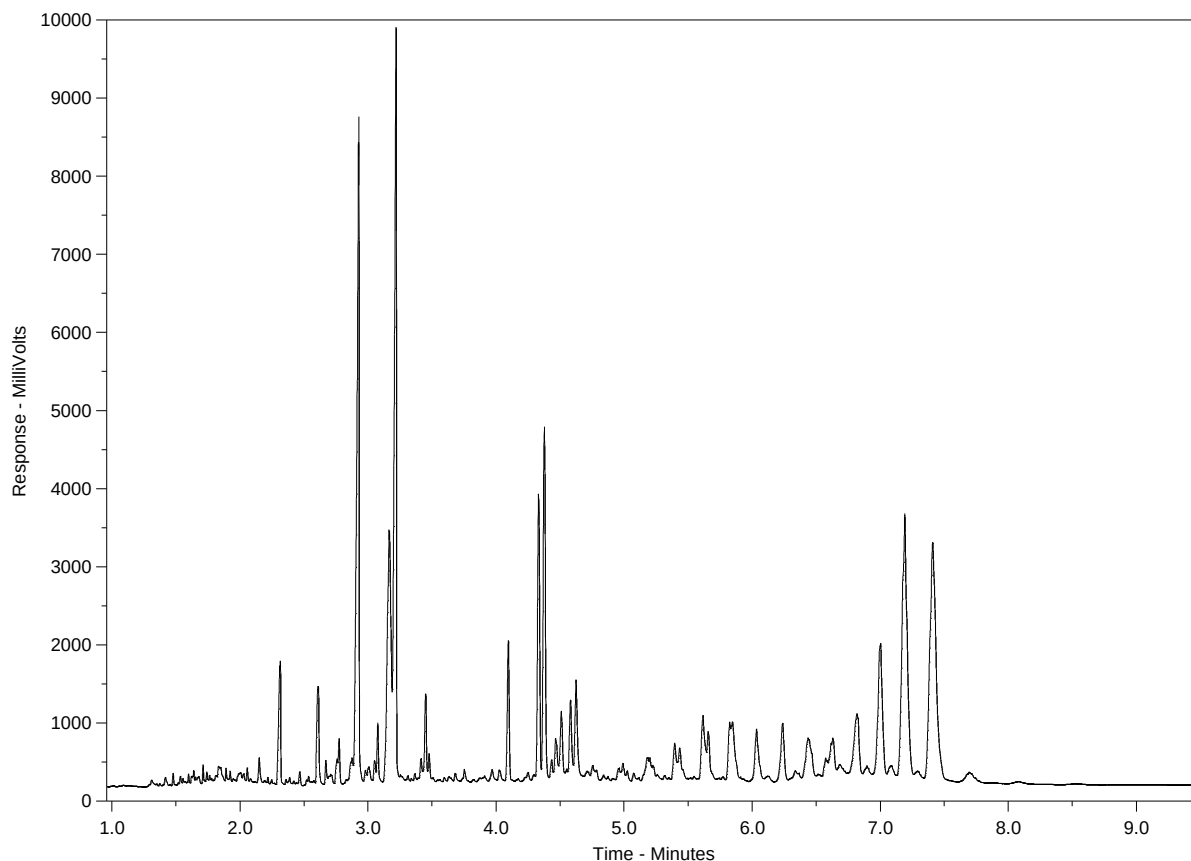
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide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



COC #

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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

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

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ALS CANADA LTD Part of the ALS Group An ALS Limited Company

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	<0.000020	DLCI	0.000020	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.

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 transferred 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 aqueous 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 Substrate 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

Workorder: L2447730

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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 CaCO ₃)			103.2		%		85-115	16-MAY-20
WG3325249-6	MB							
Alkalinity, Total (as CaCO ₃)			<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							



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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
E-C-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							



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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



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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

Workorder: L2447730

Report Date: 03-JUN-20

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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			<0.0000050		mg/L		0.000005	21-MAY-20



Quality Control Report

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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			<0.000005C		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
S04-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

Workorder: L2447730

Report Date: 03-JUN-20

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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

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Legend:

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

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Workorder: L2447730

Report Date: 03-JUN-20

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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.

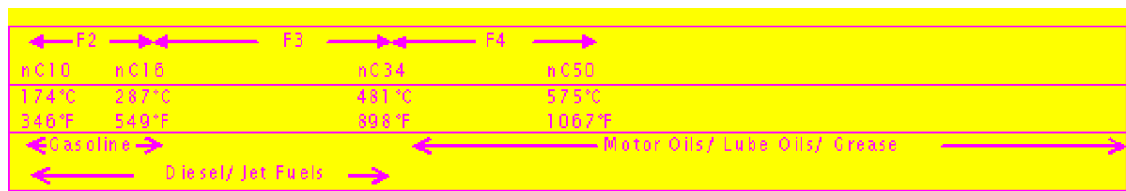
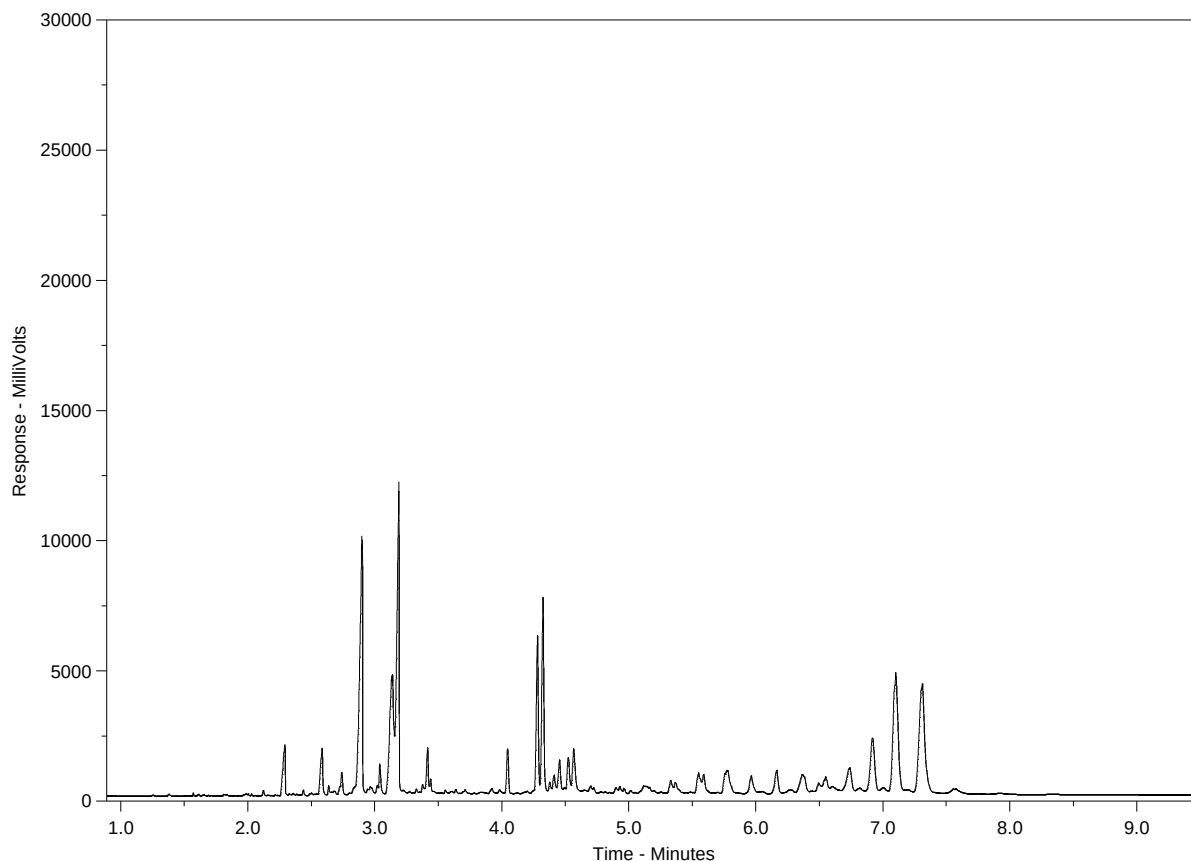
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide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



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

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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.

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 transferred 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 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

Workorder: L2456800

Report Date: 22-JUN-20

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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



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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



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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			<0.000005C		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

Workorder: L2456800

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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			<0.0000050		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



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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
N02-IC-N-WP	Water							

Quality Control Report

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
N02-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
N03-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

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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			<0.0000050		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			<0.0000050		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



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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
S04-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

Quality Control Report

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Legend:

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

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

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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.

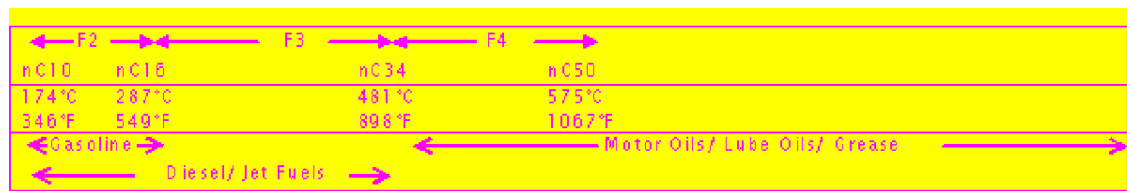
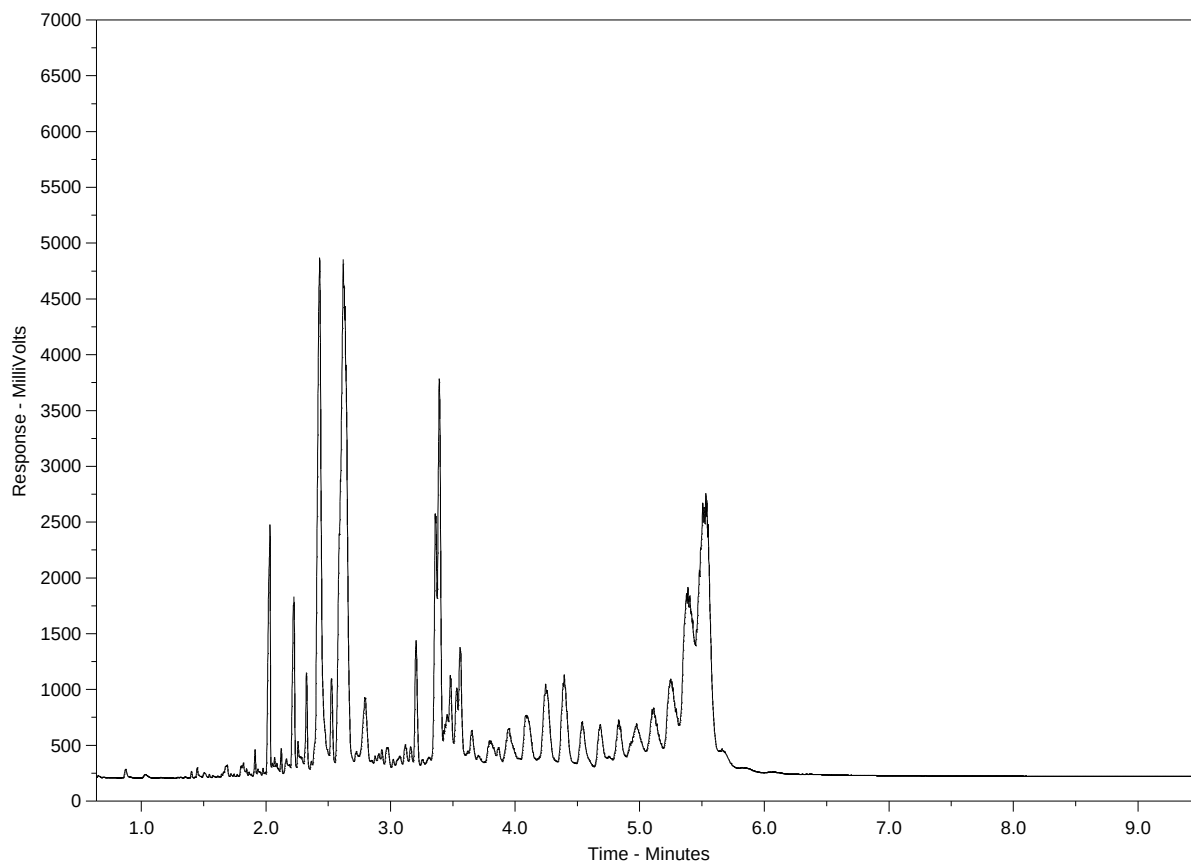
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide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



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

Date Received: 27-JUN-20
Report Date: 10-JUL-20 15:58 (MT)
Version: FINAL

Client Phone: 867-645-8113

Certificate of Analysis

Lab Work Order #: L2467001
Project P.O. #: NOT SUBMITTED
Job Reference: RANKIN INLET NU, WWTP
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

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ADDRESS: 1329 Niakwa Road East, Unit 12, Winnipeg, MB R2J 3T4 Canada | Phone: +1 204 255 9720 | Fax: +1 204 255 9721
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2467001-1 GRA-7 Sampled By: CF on 25-JUN-20 @ 13:56 Matrix: WW							
Miscellaneous Parameters							
Xylenes (Total)	<0.00064		0.00064	mg/L		07-JUL-20	
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615
Toluene	<0.0010		0.0010	mg/L		02-JUL-20	R5139615
Ethyl benzene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615
o-Xylene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615
m+p-Xylenes	<0.00040		0.00040	mg/L		02-JUL-20	R5139615
F1 (C6-C10)	<0.10		0.10	mg/L		02-JUL-20	R5139615
Surrogate: 4-Bromofluorobenzene (SS)	98.9		70-130	%		02-JUL-20	R5139615
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	06-JUL-20	07-JUL-20	R5144916
F3 (C16-C34)	<0.25		0.25	mg/L	06-JUL-20	07-JUL-20	R5144916
F4 (C34-C50)	<0.25		0.25	mg/L	06-JUL-20	07-JUL-20	R5144916
Surrogate: 2-Bromobenzotrifluoride	101.0		60-140	%	06-JUL-20	07-JUL-20	R5144916
Polyaromatic Hydrocarbons (PAHs)							
Acenaphthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Acenaphthylene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(a)anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(a)pyrene	<0.0050		0.0050	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(b)fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(k)fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Chrysene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Fluorene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Naphthalene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Phenanthrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Pyrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Surrogate: d8-Naphthalene	100.6		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d10-Phenanthrene	106.5		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d12-Chrysene	83.1		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d10-Acenaphthene	101.2		60-140	%	02-JUL-20	06-JUL-20	R5142687
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	13.4		1.2	mg/L		02-JUL-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		02-JUL-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		02-JUL-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	11.0		1.0	mg/L		30-JUN-20	R5139310
Ammonia by colour							
Ammonia, Total (as N)	<0.010		0.010	mg/L		02-JUL-20	R5139559
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		27-JUN-20	R5139611
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		27-JUN-20	R5139611
Chloride in Water by IC							
Chloride (Cl)	6.04		0.50	mg/L		27-JUN-20	R5139839

* 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
L2467001-1 GRA-7 Sampled By: CF on 25-JUN-20 @ 13:56 Matrix: WW							
Conductivity Conductivity	48.2		1.0	umhos/cm		30-JUN-20	R5139310
Fecal coliforms, 1:10 dilution by QT97 Fecal Coliforms	<10	PEHT	10	MPN/100mL		27-JUN-20	R5135420
Hardness Calculated Hardness (as CaCO3)	13.9	HTC	0.20	mg/L		08-JUL-20	
Mercury Total Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	03-JUL-20	06-JUL-20	R5143030
Nitrate in Water by IC Nitrate (as N)	<0.020		0.020	mg/L		27-JUN-20	R5139839
Nitrate+Nitrite Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-20	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		27-JUN-20	R5139839
Oil & Grease - Gravimetric Oil and Grease	<5.0		5.0	mg/L		03-JUL-20	R5142932
Phenol (4AAP) Phenols (4AAP)	<0.0010		0.0010	mg/L		30-JUN-20	R5139701
Phosphorus, Total Phosphorus (P)-Total	0.0100		0.0030	mg/L		03-JUL-20	R5140958
Sulfate in Water by IC Sulfate (SO4)	1.83		0.30	mg/L		27-JUN-20	R5139839
Total Metals in Water by CRC ICPMS Aluminum (Al)-Total	0.0198		0.0030	mg/L	03-JUL-20	03-JUL-20	R5142914
Arsenic (As)-Total	0.00041		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	03-JUL-20	03-JUL-20	R5142914
Calcium (Ca)-Total	4.26		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Chromium (Cr)-Total	<0.00010		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Copper (Cu)-Total	0.00066		0.00050	mg/L	03-JUL-20	03-JUL-20	R5142914
Iron (Fe)-Total	0.082		0.010	mg/L	03-JUL-20	03-JUL-20	R5142914
Lead (Pb)-Total	<0.000050		0.000050	mg/L	03-JUL-20	03-JUL-20	R5142914
Magnesium (Mg)-Total	0.779		0.0050	mg/L	03-JUL-20	03-JUL-20	R5142914
Manganese (Mn)-Total	0.00686		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	03-JUL-20	03-JUL-20	R5142914
Potassium (K)-Total	0.738		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Sodium (Na)-Total	3.13		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	03-JUL-20	03-JUL-20	R5142914
Total Organic Carbon by Combustion Total Organic Carbon	3.03		0.50	mg/L		09-JUL-20	R5147924
Total Suspended Solids Total Suspended Solids	<3.0		3.0	mg/L		02-JUL-20	R5147267
pH pH	7.33		0.10	pH units		30-JUN-20	R5139310
L2467001-2 GRA-6 Sampled By: CF on 25-JUN-20 @ 14:16 Matrix: WW							
Miscellaneous Parameters Xylenes (Total)	<0.00064		0.00064	mg/L		07-JUL-20	
BTX plus F1 by GCMS Benzene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615
Toluene	<0.0010		0.0010	mg/L		02-JUL-20	R5139615
Ethyl benzene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615

* 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
L2467001-2 GRA-6							
Sampled By: CF on 25-JUN-20 @ 14:16							
Matrix: WW							
BTX plus F1 by GCMS							
o-Xylene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615
m+p-Xylenes	<0.00040		0.00040	mg/L		02-JUL-20	R5139615
F1 (C6-C10)	<0.10		0.10	mg/L		02-JUL-20	R5139615
Surrogate: 4-Bromofluorobenzene (SS)	101.7		70-130	%		02-JUL-20	R5139615
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	06-JUL-20	07-JUL-20	R5144916
F3 (C16-C34)	<0.25		0.25	mg/L	06-JUL-20	07-JUL-20	R5144916
F4 (C34-C50)	<0.25		0.25	mg/L	06-JUL-20	07-JUL-20	R5144916
Surrogate: 2-Bromobenzotrifluoride	100.6		60-140	%	06-JUL-20	07-JUL-20	R5144916
Polyaromatic Hydrocarbons (PAHs)							
Acenaphthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Acenaphthylene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(a)anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(a)pyrene	<0.0050		0.0050	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(b)fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(k)fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Chrysene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Fluorene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Naphthalene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Phenanthrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Pyrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Surrogate: d8-Naphthalene	94.2		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d10-Phenanthrene	101.8		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d12-Chrysene	77.5		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d10-Acenaphthene	96.4		60-140	%	02-JUL-20	06-JUL-20	R5142687
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	14.4		1.2	mg/L		03-JUL-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		03-JUL-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		03-JUL-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	11.8		1.0	mg/L		02-JUL-20	R5140817
Ammonia by colour							
Ammonia, Total (as N)	<0.010		0.010	mg/L		02-JUL-20	R5139559
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		27-JUN-20	R5139611
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		27-JUN-20	R5139611
Chloride in Water by IC							
Chloride (Cl)	6.59		0.50	mg/L		27-JUN-20	R5139839
Conductivity							
Conductivity	52.9		1.0	umhos/cm		02-JUL-20	R5140817
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	PEHT	10	MPN/100mL		27-JUN-20	R5135420
Hardness Calculated							

* 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
L2467001-2 GRA-6 Sampled By: CF on 25-JUN-20 @ 14:16 Matrix: WW							
Hardness Calculated Hardness (as CaCO3)	15.0	HTC	0.20	mg/L		08-JUL-20	
Mercury Total Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	03-JUL-20	06-JUL-20	R5143030
Nitrate in Water by IC Nitrate (as N)	<0.020		0.020	mg/L		27-JUN-20	R5139839
Nitrate+Nitrite Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-20	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		27-JUN-20	R5139839
Oil & Grease - Gravimetric Oil and Grease	<5.0		5.0	mg/L		03-JUL-20	R5142932
Phenol (4AAP) Phenols (4AAP)	<0.0010		0.0010	mg/L		30-JUN-20	R5139701
Phosphorus, Total Phosphorus (P)-Total	0.0087		0.0030	mg/L		03-JUL-20	R5140958
Sulfate in Water by IC Sulfate (SO4)	2.02		0.30	mg/L		27-JUN-20	R5139839
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0162		0.0030	mg/L	03-JUL-20	03-JUL-20	R5142914
Arsenic (As)-Total	0.00042		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	03-JUL-20	03-JUL-20	R5142914
Calcium (Ca)-Total	4.63		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Chromium (Cr)-Total	<0.00010		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Copper (Cu)-Total	0.00070		0.00050	mg/L	03-JUL-20	03-JUL-20	R5142914
Iron (Fe)-Total	0.081		0.010	mg/L	03-JUL-20	03-JUL-20	R5142914
Lead (Pb)-Total	<0.000050		0.000050	mg/L	03-JUL-20	03-JUL-20	R5142914
Magnesium (Mg)-Total	0.834		0.0050	mg/L	03-JUL-20	03-JUL-20	R5142914
Manganese (Mn)-Total	0.00640		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Nickel (Ni)-Total	0.00053		0.00050	mg/L	03-JUL-20	03-JUL-20	R5142914
Potassium (K)-Total	0.782		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Sodium (Na)-Total	3.15		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	03-JUL-20	03-JUL-20	R5142914
Total Organic Carbon by Combustion Total Organic Carbon	3.48		0.50	mg/L		09-JUL-20	R5147924
Total Suspended Solids Total Suspended Solids	<3.0		3.0	mg/L		02-JUL-20	R5147267
pH pH	7.15		0.10	pH units		02-JUL-20	R5140817
L2467001-3 GRA-1 Sampled By: CF on 25-JUN-20 @ 14:42 Matrix: WW							
Miscellaneous Parameters							
Xylenes (Total)	<0.00064		0.00064	mg/L		07-JUL-20	
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615
Toluene	<0.0010		0.0010	mg/L		02-JUL-20	R5139615
Ethyl benzene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615
o-Xylene	<0.00050		0.00050	mg/L		02-JUL-20	R5139615
m+p-Xylenes	<0.00040		0.00040	mg/L		02-JUL-20	R5139615
F1 (C6-C10)	<0.10		0.10	mg/L		02-JUL-20	R5139615

* 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
L2467001-3 GRA-1 Sampled By: CF on 25-JUN-20 @ 14:42 Matrix: WW							
BTX plus F1 by GCMS Surrogate: 4-Bromofluorobenzene (SS)	100.5		70-130	%		02-JUL-20	R5139615
CCME PHC F2-F4 in Water F2 (C10-C16)	<0.10		0.10	mg/L	06-JUL-20	07-JUL-20	R5144916
F3 (C16-C34)	<0.25		0.25	mg/L	06-JUL-20	07-JUL-20	R5144916
F4 (C34-C50)	<0.25		0.25	mg/L	06-JUL-20	07-JUL-20	R5144916
Surrogate: 2-Bromobenzotrifluoride	101.3		60-140	%	06-JUL-20	07-JUL-20	R5144916
Polyaromatic Hydrocarbons (PAHs) Acenaphthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Acenaphthylene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(a)anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(a)pyrene	<0.0050		0.0050	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(b)fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Benzo(k)fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Chrysene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Fluoranthene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Fluorene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Naphthalene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Phenanthrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Pyrene	<0.020		0.020	ug/L	02-JUL-20	06-JUL-20	R5142687
Surrogate: d8-Naphthalene	94.6		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d10-Phenanthrene	101.2		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d12-Chrysene	76.5		60-140	%	02-JUL-20	06-JUL-20	R5142687
Surrogate: d10-Acenaphthene	96.3		60-140	%	02-JUL-20	06-JUL-20	R5142687
Nunavut WW Group 1 Alkalinity, Bicarbonate Bicarbonate (HCO3)	35.9		1.2	mg/L		03-JUL-20	
Alkalinity, Carbonate Carbonate (CO3)	<0.60		0.60	mg/L		03-JUL-20	
Alkalinity, Hydroxide Hydroxide (OH)	<0.34		0.34	mg/L		03-JUL-20	
Alkalinity, Total (as CaCO3) Alkalinity, Total (as CaCO3)	29.4		1.0	mg/L		02-JUL-20	R5140817
Ammonia by colour Ammonia, Total (as N)	0.047		0.010	mg/L		02-JUL-20	R5139559
Biochemical Oxygen Demand (BOD) Biochemical Oxygen Demand	<2.0		2.0	mg/L		27-JUN-20	R5139611
Carbonaceous BOD BOD Carbonaceous	<2.0		2.0	mg/L		27-JUN-20	R5139611
Chloride in Water by IC Chloride (Cl)	19.0		0.50	mg/L		27-JUN-20	R5139839
Conductivity Conductivity	143		1.0	umhos/cm		02-JUL-20	R5140817
Fecal coliforms, 1:10 dilution by QT97 Fecal Coliforms	<10	PEHT	10	MPN/100mL		27-JUN-20	R5135420
Hardness Calculated Hardness (as CaCO3)	42.4	HTC	0.20	mg/L		06-JUL-20	
Mercury Total Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	03-JUL-20	06-JUL-20	R5143030

* 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
L2467001-3 GRA-1 Sampled By: CF on 25-JUN-20 @ 14:42 Matrix: WW							
Nitrate in Water by IC Nitrate (as N)	<0.020		0.020	mg/L		27-JUN-20	R5139839
Nitrate+Nitrite Nitrate and Nitrite as N	<0.070		0.070	mg/L		03-JUL-20	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		27-JUN-20	R5139839
Oil & Grease - Gravimetric Oil and Grease	<5.0		5.0	mg/L		03-JUL-20	R5142932
Phenol (4AAP) Phenols (4AAP)	<0.0010		0.0010	mg/L		30-JUN-20	R5139701
Phosphorus, Total Phosphorus (P)-Total	0.0123		0.0030	mg/L		03-JUL-20	R5140958
Sulfate in Water by IC Sulfate (SO4)	10.1		0.30	mg/L		27-JUN-20	R5139839
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0301		0.0030	mg/L	03-JUL-20	03-JUL-20	R5142914
Arsenic (As)-Total	0.00086		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	03-JUL-20	03-JUL-20	R5142914
Calcium (Ca)-Total	13.1		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Chromium (Cr)-Total	0.00016		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Cobalt (Co)-Total	0.00012		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Copper (Cu)-Total	0.00096		0.00050	mg/L	03-JUL-20	03-JUL-20	R5142914
Iron (Fe)-Total	0.062		0.010	mg/L	03-JUL-20	03-JUL-20	R5142914
Lead (Pb)-Total	0.000105		0.000050	mg/L	03-JUL-20	03-JUL-20	R5142914
Magnesium (Mg)-Total	2.38		0.0050	mg/L	03-JUL-20	03-JUL-20	R5142914
Manganese (Mn)-Total	0.0315		0.00010	mg/L	03-JUL-20	03-JUL-20	R5142914
Nickel (Ni)-Total	0.00253		0.00050	mg/L	03-JUL-20	03-JUL-20	R5142914
Potassium (K)-Total	1.37		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Sodium (Na)-Total	9.83		0.050	mg/L	03-JUL-20	03-JUL-20	R5142914
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	03-JUL-20	03-JUL-20	R5142914
Total Organic Carbon by Combustion Total Organic Carbon	4.28		0.50	mg/L		09-JUL-20	R5147924
Total Suspended Solids Total Suspended Solids	<3.0		3.0	mg/L		02-JUL-20	R5147267
pH pH	7.43		0.10	pH units		02-JUL-20	R5140817

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHT	Parameter Exceeded Recommended Holding Time Prior to Analysis

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 transferred 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-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.			
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.			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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-WT	Water	Polyaromatic Hydrocarbons (PAHs)	SW846 8270
Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.			
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 aqueous matrices is determined gravimetrically after drying the residue at 103 105 C.			
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:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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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 ww - 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.

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Client: Nunavut Community & Government Services - Rankin Inlet

P.O. Box 490

Rankin Inlet NU X0C 0G0

Contact: CONNOR FAULKNER (Rankin Inlet)

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-WP Water								
Batch	R5139310							
WG3353886-25 DUP		L2467001-1						
Alkalinity, Total (as CaCO3)		11.0	11.2		mg/L	1.8	20	30-JUN-20
WG3353886-24 LCS								
Alkalinity, Total (as CaCO3)			102.9		%		85-115	30-JUN-20
WG3353886-21 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	30-JUN-20
Batch	R5140817							
WG3354954-5 DUP		L2467001-2						
Alkalinity, Total (as CaCO3)		11.8	11.7		mg/L	0.9	20	02-JUL-20
WG3354954-4 LCS								
Alkalinity, Total (as CaCO3)			101.6		%		85-115	02-JUL-20
WG3354954-1 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	02-JUL-20
BOD-CBOD-WP Water								
Batch	R5139611							
WG3351387-2 LCS								
BOD Carbonaceous			106.5		%		85-115	27-JUN-20
WG3351387-1 MB								
BOD Carbonaceous			<2.0		mg/L		2	27-JUN-20
BOD-WP Water								
Batch	R5139611							
WG3351387-2 LCS								
Biochemical Oxygen Demand			107.0		%		85-115	27-JUN-20
WG3351387-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	27-JUN-20
BTEXS+F1-HSMS-WP Water								
Batch	R5139615							
WG3351994-2 LCS								
Benzene			103.0		%		70-130	29-JUN-20
Toluene			104.3		%		70-130	29-JUN-20
Ethyl benzene			107.4		%		70-130	29-JUN-20
o-Xylene			109.5		%		70-130	29-JUN-20
m+p-Xylenes			111.6		%		70-130	29-JUN-20
WG3351994-3 LCS								
F1 (C6-C10)			111.6		%		70-130	29-JUN-20
WG3351994-1 MB								
Benzene			<0.00050		mg/L		0.0005	29-JUN-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTEXS+F1-HSMS-WP	Water							
Batch	R5139615							
WG3351994-1 MB								
Toluene			<0.0010		mg/L		0.001	29-JUN-20
Ethyl benzene			<0.00050		mg/L		0.0005	29-JUN-20
o-Xylene			<0.00050		mg/L		0.0005	29-JUN-20
m+p-Xylenes			<0.00040		mg/L		0.0004	29-JUN-20
F1 (C6-C10)			<0.10		mg/L		0.1	29-JUN-20
Surrogate: 4-Bromofluorobenzene (SS)			108.7		%		70-130	29-JUN-20
C-TOC-HTC-WP	Water							
Batch	R5147924							
WG3359692-2 LCS								
Total Organic Carbon			101.3		%		80-120	09-JUL-20
WG3359692-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	09-JUL-20
CL-IC-N-WP	Water							
Batch	R5139839							
WG3351429-6 LCS								
Chloride (Cl)			99.7		%		90-110	27-JUN-20
WG3351429-5 MB								
Chloride (Cl)			<0.50		mg/L		0.5	27-JUN-20
EC-WP	Water							
Batch	R5139310							
WG3353886-25 DUP		L2467001-1						
Conductivity		48.2	49.4		umhos/cm	2.5	10	30-JUN-20
WG3353886-23 LCS								
Conductivity			96.3		%		90-110	30-JUN-20
WG3353886-21 MB								
Conductivity			<1.0		umhos/cm		1	30-JUN-20
Batch	R5140817							
WG3354954-5 DUP		L2467001-2						
Conductivity		52.9	51.8		umhos/cm	2.1	10	02-JUL-20
WG3354954-3 LCS								
Conductivity			99.3		%		90-110	02-JUL-20
WG3354954-1 MB								
Conductivity			<1.0		umhos/cm		1	02-JUL-20
F2-F4-FID-WP	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-FID-WP	Water							
Batch	R5144916							
WG3356399-2	LCS							
F2 (C10-C16)			87.6		%		70-130	07-JUL-20
F3 (C16-C34)			82.7		%		70-130	07-JUL-20
F4 (C34-C50)			80.4		%		70-130	07-JUL-20
WG3356399-1	MB							
F2 (C10-C16)			<0.10		mg/L		0.1	07-JUL-20
F3 (C16-C34)			<0.25		mg/L		0.25	07-JUL-20
F4 (C34-C50)			<0.25		mg/L		0.25	07-JUL-20
Surrogate: 2-Bromobenzotrifluoride			99.8		%		60-140	07-JUL-20
FC10-QT97-WP	Water							
Batch	R5135420							
WG3351613-1	MB							
Fecal Coliforms			<1		MPN/100mL		1	27-JUN-20
HG-T-CVAA-WP	Water							
Batch	R5143030							
WG3356391-2	LCS							
Mercury (Hg)-Total			110.0		%		80-120	06-JUL-20
WG3356391-1	MB							
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	06-JUL-20
MET-T-CCMS-WP	Water							
Batch	R5142914							
WG3354517-2	LCS							
Aluminum (Al)-Total			103.1		%		80-120	03-JUL-20
Arsenic (As)-Total			100.6		%		80-120	03-JUL-20
Cadmium (Cd)-Total			99.5		%		80-120	03-JUL-20
Calcium (Ca)-Total			100.4		%		80-120	03-JUL-20
Chromium (Cr)-Total			100.5		%		80-120	03-JUL-20
Cobalt (Co)-Total			100.7		%		80-120	03-JUL-20
Copper (Cu)-Total			100.0		%		80-120	03-JUL-20
Iron (Fe)-Total			98.4		%		80-120	03-JUL-20
Lead (Pb)-Total			105.9		%		80-120	03-JUL-20
Magnesium (Mg)-Total			98.2		%		80-120	03-JUL-20
Manganese (Mn)-Total			99.8		%		80-120	03-JUL-20
Nickel (Ni)-Total			99.3		%		80-120	03-JUL-20
Potassium (K)-Total			101.1		%		80-120	03-JUL-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R5142914							
WG3354517-2	LCS							
Sodium (Na)-Total			99.1		%		80-120	03-JUL-20
Zinc (Zn)-Total			102.2		%		80-120	03-JUL-20
WG3354517-1	MB							
Aluminum (Al)-Total			<0.0030		mg/L		0.003	03-JUL-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Cadmium (Cd)-Total			<0.000005C		mg/L		0.000005	03-JUL-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	03-JUL-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	03-JUL-20
Iron (Fe)-Total			<0.010		mg/L		0.01	03-JUL-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	03-JUL-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	03-JUL-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	03-JUL-20
Potassium (K)-Total			<0.050		mg/L		0.05	03-JUL-20
Sodium (Na)-Total			<0.050		mg/L		0.05	03-JUL-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	03-JUL-20
NH3-COL-WP	Water							
Batch	R5139559							
WG3354179-18	LCS							
Ammonia, Total (as N)			101.6		%		85-115	02-JUL-20
WG3354179-17	MB							
Ammonia, Total (as N)			<0.010		mg/L		0.01	02-JUL-20
N02-IC-N-WP	Water							
Batch	R5139839							
WG3351429-6	LCS							
Nitrite (as N)			103.3		%		90-110	27-JUN-20
WG3351429-5	MB							
Nitrite (as N)			<0.010		mg/L		0.01	27-JUN-20
N03-IC-N-WP	Water							
Batch	R5139839							
WG3351429-6	LCS							
Nitrate (as N)			100.9		%		90-110	27-JUN-20
WG3351429-5	MB							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
N03-IC-N-WP	Water							
Batch	R5139839							
WG3351429-5 MB								
Nitrate (as N)			<0.020		mg/L		0.02	27-JUN-20
OG-GRAV-WP	Water							
Batch	R5142932							
WG3354784-2 LCS								
Oil and Grease			97.8		%		70-130	03-JUL-20
WG3354784-1 MB								
Oil and Grease			<5.0		mg/L		5	03-JUL-20
P-T-COL-WP	Water							
Batch	R5140958							
WG3354450-22 LCS								
Phosphorus (P)-Total			90.9		%		80-120	03-JUL-20
WG3354450-21 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	03-JUL-20
PAH-WT	Water							
Batch	R5142687							
WG3354601-2 LCS								
Acenaphthene			96.6		%		50-140	06-JUL-20
Acenaphthylene			101.1		%		50-140	06-JUL-20
Anthracene			102.6		%		50-140	06-JUL-20
Benzo(a)anthracene			97.2		%		50-140	06-JUL-20
Benzo(a)pyrene			88.4		%		60-130	06-JUL-20
Benzo(b)fluoranthene			104.1		%		50-140	06-JUL-20
Benzo(g,h,i)perylene			109.6		%		50-140	06-JUL-20
Benzo(k)fluoranthene			102.9		%		50-140	06-JUL-20
Chrysene			94.0		%		50-140	06-JUL-20
Dibenzo(ah)anthracene			102.2		%		50-140	06-JUL-20
Fluoranthene			105.8		%		50-140	06-JUL-20
Fluorene			101.9		%		50-140	06-JUL-20
Indeno(1,2,3-cd)pyrene			113.8		%		50-140	06-JUL-20
Naphthalene			87.5		%		50-130	06-JUL-20
Phenanthrene			106.7		%		50-140	06-JUL-20
Pyrene			106.9		%		50-140	06-JUL-20
WG3354601-1 MB								
Acenaphthene			<0.020		ug/L		0.02	06-JUL-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-WT	Water							
Batch	R5142687							
WG3354601-1 MB								
Acenaphthylene			<0.020		ug/L		0.02	06-JUL-20
Anthracene			<0.020		ug/L		0.02	06-JUL-20
Benzo(a)anthracene			<0.020		ug/L		0.02	06-JUL-20
Benzo(a)pyrene			<0.0050		ug/L		0.005	06-JUL-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	06-JUL-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	06-JUL-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	06-JUL-20
Chrysene			<0.020		ug/L		0.02	06-JUL-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	06-JUL-20
Fluoranthene			<0.020		ug/L		0.02	06-JUL-20
Fluorene			<0.020		ug/L		0.02	06-JUL-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	06-JUL-20
Naphthalene			<0.020		ug/L		0.02	06-JUL-20
Phenanthrene			<0.020		ug/L		0.02	06-JUL-20
Pyrene			<0.020		ug/L		0.02	06-JUL-20
Surrogate: d8-Naphthalene			100.9		%		60-140	06-JUL-20
Surrogate: d10-Phenanthrene			108.5		%		60-140	06-JUL-20
Surrogate: d12-Chrysene			85.2		%		60-140	06-JUL-20
Surrogate: d10-Acenaphthene			103.2		%		60-140	06-JUL-20
PH-WP	Water							
Batch	R5139310							
WG3353886-25 DUP		L2467001-1						
pH		7.33	7.34	J	pH units	0.01	0.2	30-JUN-20
WG3353886-22 LCS								
pH			7.38		pH units		7.3-7.5	30-JUN-20
Batch	R5140817							
WG3354954-5 DUP		L2467001-2						
pH		7.15	7.14	J	pH units	0.01	0.2	02-JUL-20
WG3354954-2 LCS								
pH			7.35		pH units		7.3-7.5	02-JUL-20
PHENOLS-4AAP-WT	Water							
Batch	R5139701							
WG3353291-2 LCS								
Phenols (4AAP)			104.9		%		85-115	30-JUN-20
WG3353291-1 MB								



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PHENOLS-4AAP-WT	Water							
Batch R5139701								
WG3353291-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	30-JUN-20
S04-IC-N-WP	Water							
Batch R5139839								
WG3351429-6 LCS								
Sulfate (SO4)			101.5		%		90-110	27-JUN-20
WG3351429-5 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	27-JUN-20
SOLIDS-TOTSUS-WP	Water							
Batch R5147267								
WG3354056-9 DUP		L2467001-2						
Total Suspended Solids		<3.0	<3.0	RPD-NA	mg/L	N/A	20	02-JUL-20
WG3354056-5 LCS								
Total Suspended Solids			91.8		%		85-115	02-JUL-20
WG3354056-8 LCS								
Total Suspended Solids			95.2		%		85-115	02-JUL-20
WG3354056-4 MB								
Total Suspended Solids			<3.0		mg/L		3	02-JUL-20
WG3354056-7 MB								
Total Suspended Solids			<3.0		mg/L		3	02-JUL-20

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Legend:

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

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.

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	1	25-JUN-20 13:56	30-JUN-20 12:00	0.25	118	hours	EHTR-FM
	2	25-JUN-20 14:16	02-JUL-20 12:00	0.25	166	hours	EHTR-FM
	3	25-JUN-20 14:42	02-JUL-20 12:00	0.25	165	hours	EHTR-FM
Bacteriological Tests							
Fecal coliforms, 1:10 dilution by QT97							
	1	25-JUN-20 13:56	27-JUN-20 14:55	30	49	hours	EHTR
	2	25-JUN-20 14:16	27-JUN-20 14:55	30	49	hours	EHTR
	3	25-JUN-20 14:42	27-JUN-20 14:55	30	48	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 L2467001 were received on 27-JUN-20 09:35.

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.

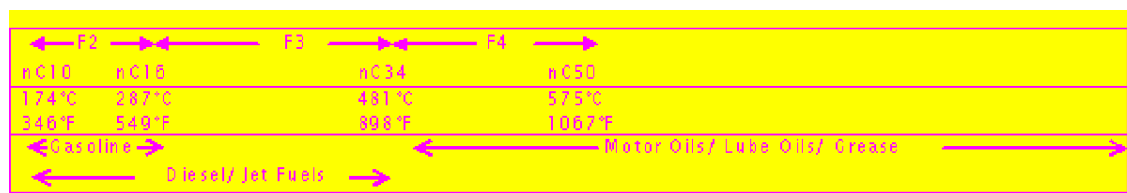
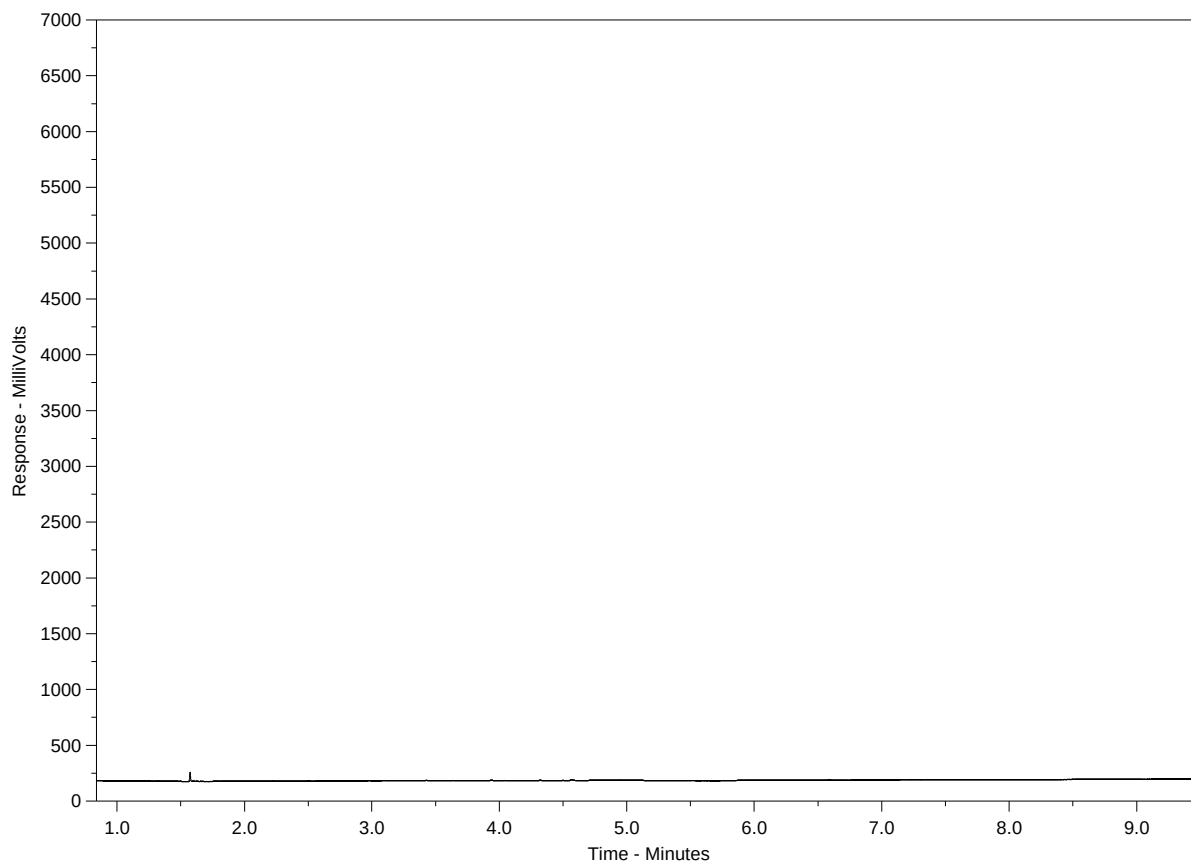
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide 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: L2467001-1
Client Sample ID: GRA-7



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.

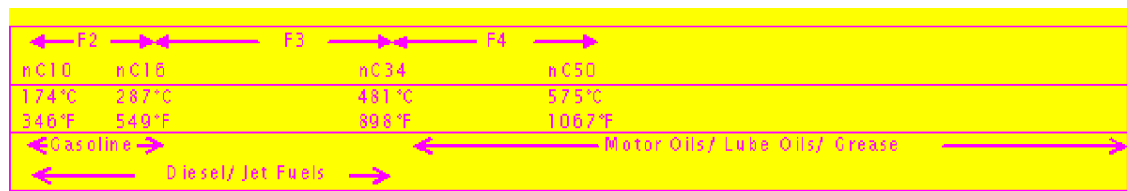
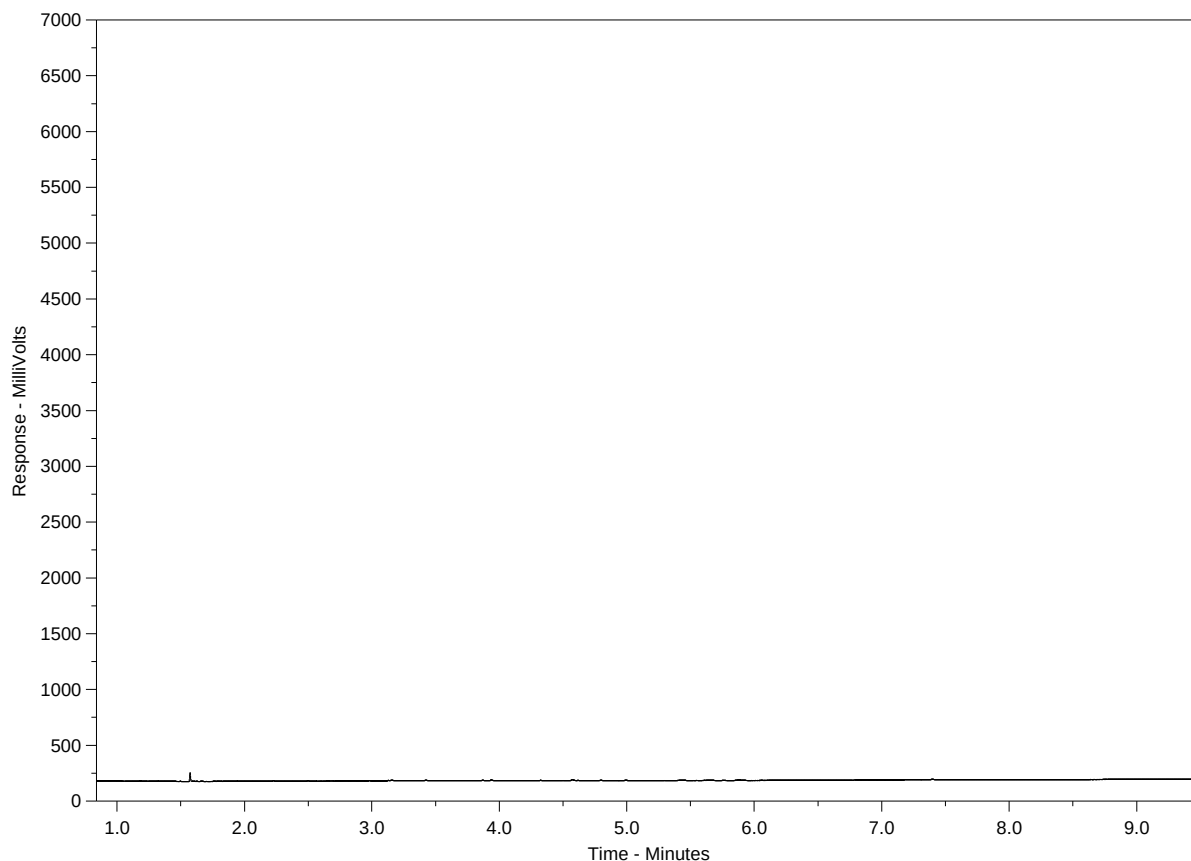
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2467001-2
Client Sample ID: GRA-6



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.

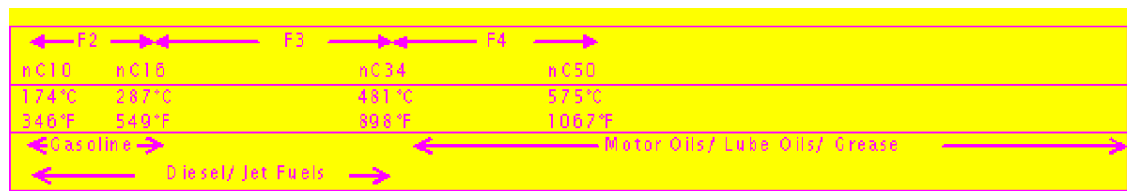
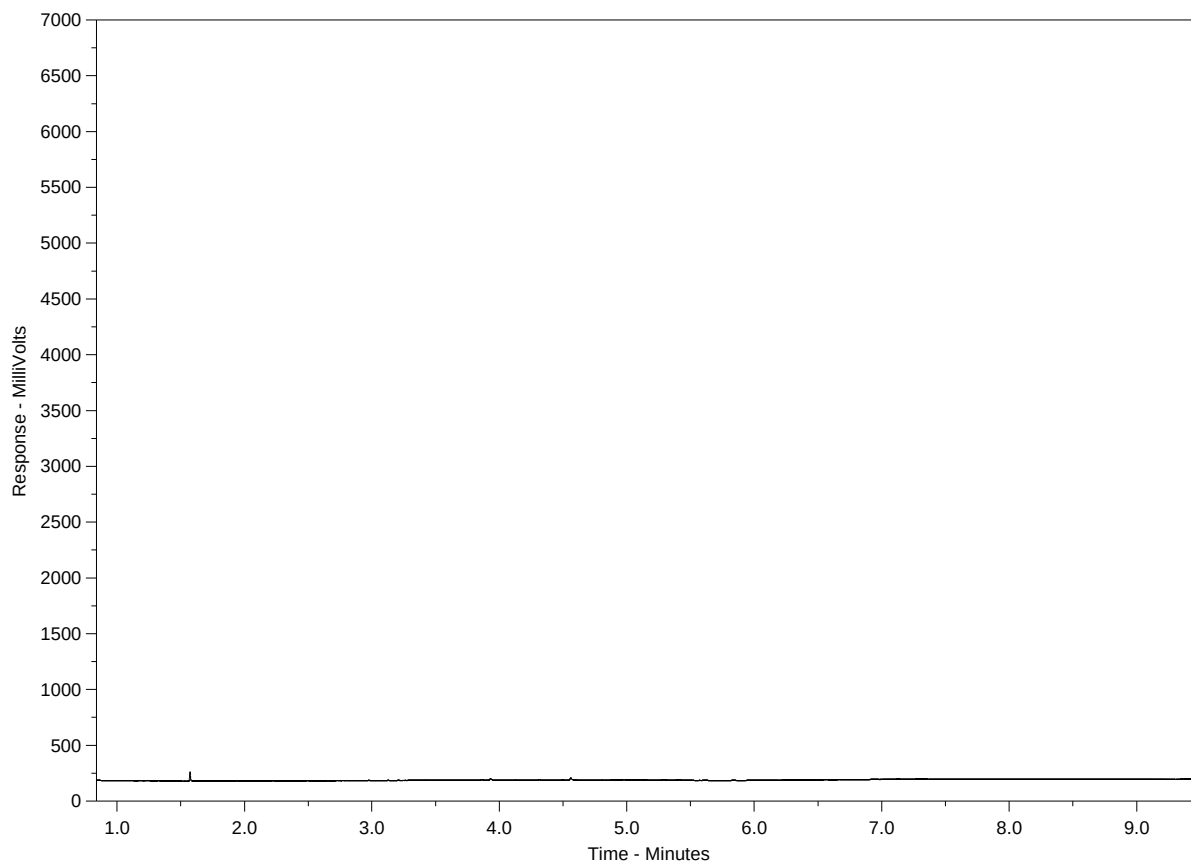
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2467001-3
Client Sample ID: GRA-1



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.

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2467001-COFC

COC Number: 17 - 751078

Page 1 of 1

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[illegible]

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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YELLOW - CLIENT COPY

JUNE 2018 FROM

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

[illegible]



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

Date Received: 24-JUL-20
Report Date: 04-AUG-20 14:38 (MT)
Version: FINAL

Client Phone: 867-645-8155

Certificate of Analysis

Lab Work Order #: L2479347

Project P.O. #: NOT SUBMITTED

Job Reference: RANKIN INLET WWTP - MONTHLY EFFLUENT

C of C Numbers:

Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 1329 Niakwa Road East, Unit 12, Winnipeg, MB R2J 3T4 Canada | Phone: +1 204 255 9720 | Fax: +1 204 255 9721
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2479347-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: sd on 23-JUL-20 @ 09:30							
Matrix: waste							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050	VOCHS	0.00050	mg/L		26-JUL-20	R5167214
Toluene	0.0011	VOCHS	0.0010	mg/L		26-JUL-20	R5167214
Ethyl benzene	<0.00050	VOCHS	0.00050	mg/L		26-JUL-20	R5167214
o-Xylene	<0.00050	VOCHS	0.00050	mg/L		26-JUL-20	R5167214
m+p-Xylenes	<0.00040	VOCHS	0.00040	mg/L		26-JUL-20	R5167214
F1 (C6-C10)	<0.10	VOCHS	0.10	mg/L		26-JUL-20	R5167214
Surrogate: 4-Bromofluorobenzene (SS)	86.1		70-130	%		26-JUL-20	R5167214
CCME PHC F2-F4 in Water							
F2 (C10-C16)	0.37		0.10	mg/L	25-JUL-20	25-JUL-20	R5167079
F3 (C16-C34)	8.58		0.25	mg/L	25-JUL-20	25-JUL-20	R5167079
F4 (C34-C50)	2.54		0.25	mg/L	25-JUL-20	25-JUL-20	R5167079
Surrogate: 2-Bromobenzotrifluoride	95.9		60-140	%	25-JUL-20	25-JUL-20	R5167079
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		04-AUG-20	
F2-Naphth	0.37		0.10	mg/L		04-AUG-20	
F3-PAH	8.58		0.25	mg/L		04-AUG-20	
Total Hydrocarbons (C6-C50)	11.5		0.38	mg/L		04-AUG-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		28-JUL-20	
Miscellaneous Parameters							
Fluoride (F)	0.192		0.020	mg/L		24-JUL-20	R5171947
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	>24200	MBHT	10	MPN/100mL		24-JUL-20	R5167588
Escherichia Coli	>24200	MBHT	10	MPN/100mL		24-JUL-20	R5167588
CCME PAHs in mg/L							
1-Methyl Naphthalene	0.000024		0.000020	mg/L	29-JUL-20	04-AUG-20	R5173752
2-Methyl Naphthalene	0.000031		0.000020	mg/L	29-JUL-20	04-AUG-20	R5173752
Acenaphthene	<0.000020		0.000020	mg/L	29-JUL-20	04-AUG-20	R5173752
Acenaphthylene	<0.000020		0.000020	mg/L	29-JUL-20	04-AUG-20	R5173752
Anthracene	<0.000010		0.000010	mg/L	29-JUL-20	04-AUG-20	R5173752
Acridine	<0.000020		0.000020	mg/L	29-JUL-20	04-AUG-20	R5173752
Benzo(a)anthracene	<0.000010		0.000010	mg/L	29-JUL-20	04-AUG-20	R5173752
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	29-JUL-20	04-AUG-20	R5173752
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	29-JUL-20	04-AUG-20	R5173752
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	29-JUL-20	04-AUG-20	R5173752
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	29-JUL-20	04-AUG-20	R5173752
Chrysene	<0.000020		0.000020	mg/L	29-JUL-20	04-AUG-20	R5173752
Dibenzo(a,h)anthracene	0.0000125		0.0000050	mg/L	29-JUL-20	04-AUG-20	R5173752
Fluoranthene	<0.000020		0.000020	mg/L	29-JUL-20	04-AUG-20	R5173752
Fluorene	0.000025	R	0.000020	mg/L	29-JUL-20	04-AUG-20	R5173752
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	29-JUL-20	04-AUG-20	R5173752
Naphthalene	<0.000050		0.000050	mg/L	29-JUL-20	04-AUG-20	R5173752
Phenanthrene	<0.000050		0.000050	mg/L	29-JUL-20	04-AUG-20	R5173752
Pyrene	<0.000010		0.000010	mg/L	29-JUL-20	04-AUG-20	R5173752
Quinoline	0.000038		0.000020	mg/L	29-JUL-20	04-AUG-20	R5173752
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	29-JUL-20	04-AUG-20	R5173752
Surrogate: d8-Naphthalene	115.4		50-150	%	29-JUL-20	04-AUG-20	R5173752
Surrogate: d10-Phenanthrene	110.2		50-150	%	29-JUL-20	04-AUG-20	R5173752
Surrogate: d12-Chrysene	108.6		50-150	%	29-JUL-20	04-AUG-20	R5173752
Surrogate: d10-Acenaphthene	104.2		50-150	%	29-JUL-20	04-AUG-20	R5173752
Surrogate: d9-Acridine (SS)	114.1		50-150	%	29-JUL-20	04-AUG-20	R5173752

* 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
L2479347-1 RANKIN INLET WWTP - EFFLUENT Sampled By: sd on 23-JUL-20 @ 09:30 Matrix: waste Nunavut WW Group 1							
Alkalinity, Bicarbonate Bicarbonate (HCO3)	128		1.2	mg/L		29-JUL-20	
Alkalinity, Carbonate Carbonate (CO3)	<0.60		0.60	mg/L		29-JUL-20	
Alkalinity, Hydroxide Hydroxide (OH)	<0.34		0.34	mg/L		29-JUL-20	
Alkalinity, Total (as CaCO3) Alkalinity, Total (as CaCO3)	105		1.0	mg/L		28-JUL-20	R5170696
Ammonia by colour Ammonia, Total (as N)	8.45		0.20	mg/L		30-JUL-20	R5172873
Biochemical Oxygen Demand (BOD) Biochemical Oxygen Demand	85		20	mg/L		24-JUL-20	R5172037
Carbonaceous BOD BOD Carbonaceous	66		20	mg/L		24-JUL-20	R5172037
Chloride in Water by IC Chloride (Cl)	40.8		0.50	mg/L		24-JUL-20	R5171947
Conductivity Conductivity	388		1.0	umhos/cm		28-JUL-20	R5170696
Fecal coliforms, 1:10 dilution by QT97 Fecal Coliforms	>24200		10	MPN/100mL		24-JUL-20	R5167608
Hardness Calculated Hardness (as CaCO3)	57.9	HTC	0.20	mg/L		29-JUL-20	
Mercury Total Mercury (Hg)-Total	0.0000110		0.0000050	mg/L	30-JUL-20	30-JUL-20	R5172313
Nitrate in Water by IC Nitrate (as N)	<0.020		0.020	mg/L		24-JUL-20	R5171947
Nitrate+Nitrite Nitrate and Nitrite as N	<0.070		0.070	mg/L		30-JUL-20	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		24-JUL-20	R5171947
Oil & Grease - Gravimetric Oil and Grease	16.5		5.0	mg/L		29-JUL-20	R5174085
Phenol (4AAP) Phenols (4AAP)	0.0130		0.0010	mg/L		30-JUL-20	R5172855
Phosphorus, Total Phosphorus (P)-Total	2.86		0.030	mg/L		29-JUL-20	R5171429
Sulfate in Water by IC Sulfate (SO4)	18.8		0.30	mg/L		24-JUL-20	R5171947
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.106		0.0030	mg/L	28-JUL-20	28-JUL-20	R5170980
Antimony (Sb)-Total	0.00012		0.00010	mg/L	28-JUL-20	28-JUL-20	R5170980
Arsenic (As)-Total	0.00089		0.00010	mg/L	28-JUL-20	28-JUL-20	R5170980
Barium (Ba)-Total	0.0198		0.00010	mg/L	28-JUL-20	28-JUL-20	R5170980
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	28-JUL-20	28-JUL-20	R5170980
Bismuth (Bi)-Total	0.00197		0.000050	mg/L	28-JUL-20	28-JUL-20	R5170980
Boron (B)-Total	0.067		0.010	mg/L	28-JUL-20	28-JUL-20	R5170980
Cadmium (Cd)-Total	0.0000775		0.0000050	mg/L	28-JUL-20	28-JUL-20	R5170980
Calcium (Ca)-Total	16.7		0.050	mg/L	28-JUL-20	28-JUL-20	R5170980
Cesium (Cs)-Total	0.000049		0.000010	mg/L	28-JUL-20	28-JUL-20	R5170980
Chromium (Cr)-Total	0.00057		0.00010	mg/L	28-JUL-20	28-JUL-20	R5170980
Cobalt (Co)-Total	0.00021		0.00010	mg/L	28-JUL-20	28-JUL-20	R5170980
Copper (Cu)-Total	0.119		0.00050	mg/L	28-JUL-20	28-JUL-20	R5170980

* 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
L2479347-1	RANKIN INLET WWTP - EFFLUENT							
Sampled By:	sd on 23-JUL-20 @ 09:30							
Matrix:	waste							
Total Metals in Water by CRC ICPMS								
Iron (Fe)-Total		0.408		0.010	mg/L	28-JUL-20	28-JUL-20	R5170980
Lead (Pb)-Total		0.00129		0.000050	mg/L	28-JUL-20	28-JUL-20	R5170980
Lithium (Li)-Total		0.0021		0.0010	mg/L	28-JUL-20	28-JUL-20	R5170980
Magnesium (Mg)-Total		3.95		0.0050	mg/L	28-JUL-20	28-JUL-20	R5170980
Manganese (Mn)-Total		0.0352		0.00010	mg/L	28-JUL-20	28-JUL-20	R5170980
Molybdenum (Mo)-Total		0.000757		0.000050	mg/L	28-JUL-20	28-JUL-20	R5170980
Nickel (Ni)-Total		0.00241		0.00050	mg/L	28-JUL-20	28-JUL-20	R5170980
Potassium (K)-Total		6.48		0.050	mg/L	28-JUL-20	28-JUL-20	R5170980
Phosphorus (P)-Total		2.77		0.030	mg/L	28-JUL-20	28-JUL-20	R5170980
Rubidium (Rb)-Total		0.00698		0.00020	mg/L	28-JUL-20	28-JUL-20	R5170980
Selenium (Se)-Total		0.000179		0.000050	mg/L	28-JUL-20	28-JUL-20	R5170980
Silicon (Si)-Total		0.29		0.10	mg/L	28-JUL-20	28-JUL-20	R5170980
Silver (Ag)-Total		0.000022		0.000010	mg/L	28-JUL-20	28-JUL-20	R5170980
Sodium (Na)-Total		22.6		0.050	mg/L	28-JUL-20	28-JUL-20	R5170980
Strontium (Sr)-Total		0.0807		0.00020	mg/L	28-JUL-20	28-JUL-20	R5170980
Sulfur (S)-Total		7.26		0.50	mg/L	28-JUL-20	28-JUL-20	R5170980
Tellurium (Te)-Total		<0.00020		0.00020	mg/L	28-JUL-20	28-JUL-20	R5170980
Thallium (Tl)-Total		<0.000010		0.000010	mg/L	28-JUL-20	28-JUL-20	R5170980
Thorium (Th)-Total		<0.00010		0.00010	mg/L	28-JUL-20	28-JUL-20	R5170980
Tin (Sn)-Total		0.00061		0.00010	mg/L	28-JUL-20	28-JUL-20	R5170980
Titanium (Ti)-Total		0.00475		0.00030	mg/L	28-JUL-20	28-JUL-20	R5170980
Tungsten (W)-Total		<0.00010		0.00010	mg/L	28-JUL-20	28-JUL-20	R5170980
Uranium (U)-Total		0.000134		0.000010	mg/L	28-JUL-20	28-JUL-20	R5170980
Vanadium (V)-Total		<0.00050		0.00050	mg/L	28-JUL-20	28-JUL-20	R5170980
Zinc (Zn)-Total		0.0810		0.0030	mg/L	28-JUL-20	28-JUL-20	R5170980
Zirconium (Zr)-Total		0.00050		0.00020	mg/L	28-JUL-20	28-JUL-20	R5170980
Total Organic Carbon by Combustion								
Total Organic Carbon		61.9		2.5	mg/L		31-JUL-20	R5174019
Total Suspended Solids								
Total Suspended Solids		59.6		3.0	mg/L		28-JUL-20	R5171385
pH								
pH		7.25		0.10	pH units		28-JUL-20	R5170696

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DUPM	MPN duplicate results were outside default ALS Data Quality Objective, but within 95% confidence interval for MPN reference method. Sample results are reliable.
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MBHT	The APHA 30 hour hold time was exceeded for microbiological testing. Samples processed within 48 hours from time of sampling may be valid in some cases (refer to Health Canada guidance).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
R	The ion abundance ratio(s) did not meet the acceptance criteria. Value is an estimated maximum.
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 transferred 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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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. 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)

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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
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 aqueous 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 Substrate 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 ww - 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.

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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	R5170696							
WG3372669-9	LCS							
Alkalinity, Total (as CaCO ₃)			102.3		%		85-115	28-JUL-20
WG3372669-6	MB							
Alkalinity, Total (as CaCO ₃)			<1.0		mg/L		1	28-JUL-20
BOD-CBOD-WP	Water							
Batch	R5172037							
WG3369667-7	LCS							
BOD Carbonaceous			98.9		%		85-115	24-JUL-20
WG3369667-6	MB							
BOD Carbonaceous			<2.0		mg/L		2	24-JUL-20
BOD-WP	Water							
Batch	R5172037							
WG3369667-7	LCS							
Biochemical Oxygen Demand			104.1		%		85-115	24-JUL-20
WG3369667-6	MB							
Biochemical Oxygen Demand			<2.0		mg/L		2	24-JUL-20
BTEXS+F1-HSMS-WP	Water							
Batch	R5167214							
WG3370589-8	LCS							
Benzene			83.2		%		70-130	25-JUL-20
Toluene			86.5		%		70-130	25-JUL-20
Ethyl benzene			87.8		%		70-130	25-JUL-20
o-Xylene			102.1		%		70-130	25-JUL-20
m+p-Xylenes			97.7		%		70-130	25-JUL-20
WG3370589-9	LCS							
F1 (C6-C10)			92.8		%		70-130	25-JUL-20
WG3370589-7	MB							
Benzene			<0.00050		mg/L		0.0005	25-JUL-20
Toluene			<0.0010		mg/L		0.001	25-JUL-20
Ethyl benzene			<0.00050		mg/L		0.0005	25-JUL-20
o-Xylene			<0.00050		mg/L		0.0005	25-JUL-20
m+p-Xylenes			<0.00040		mg/L		0.0004	25-JUL-20
F1 (C6-C10)			<0.10		mg/L		0.1	25-JUL-20
Surrogate: 4-Bromofluorobenzene (SS)			90.6		%		70-130	25-JUL-20
C-TOC-HTC-WP	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-TOC-HTC-WP	Water							
Batch	R5174019							
WG3375973-2	LCS							
Total Organic Carbon			100.1		%		80-120	31-JUL-20
WG3375973-1	MB							
Total Organic Carbon			<0.50		mg/L		0.5	31-JUL-20
CL-IC-N-WP	Water							
Batch	R5171947							
WG3369900-10	LCS							
Chloride (Cl)			98.5		%		90-110	24-JUL-20
WG3369900-9	MB							
Chloride (Cl)			<0.50		mg/L		0.5	24-JUL-20
E-C-WP	Water							
Batch	R5170696							
WG3372669-8	LCS							
Conductivity			98.4		%		90-110	28-JUL-20
WG3372669-6	MB							
Conductivity			<1.0		umhos/cm		1	28-JUL-20
F-IC-N-WP	Water							
Batch	R5171947							
WG3369900-10	LCS							
Fluoride (F)			100.9		%		90-110	24-JUL-20
WG3369900-9	MB							
Fluoride (F)			<0.020		mg/L		0.02	24-JUL-20
F2-F4-FID-WP	Water							
Batch	R5167079							
WG3369781-6	LCS							
F2 (C10-C16)			101.1		%		70-130	24-JUL-20
F3 (C16-C34)			93.2		%		70-130	24-JUL-20
F4 (C34-C50)			110.8		%		70-130	24-JUL-20
WG3369781-5	MB							
F2 (C10-C16)			<0.10		mg/L		0.1	24-JUL-20
F3 (C16-C34)			<0.25		mg/L		0.25	24-JUL-20
F4 (C34-C50)			<0.25		mg/L		0.25	24-JUL-20
Surrogate: 2-Bromobenzotrifluoride			91.2		%		60-140	24-JUL-20
FC10-QT97-WP	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
FC10-QT97-WP	Water							
Batch	R5167608							
WG3370169-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	24-JUL-20
HG-T-CVAA-WP	Water							
Batch	R5172313							
WG3373912-2 LCS								
Mercury (Hg)-Total			102.0		%		80-120	30-JUL-20
WG3373912-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	30-JUL-20
MET-T-CCMS-WP	Water							
Batch	R5170980							
WG3371342-2 LCS								
Aluminum (Al)-Total			99.3		%		80-120	28-JUL-20
Antimony (Sb)-Total			100.6		%		80-120	28-JUL-20
Arsenic (As)-Total			98.8		%		80-120	28-JUL-20
Barium (Ba)-Total			97.9		%		80-120	28-JUL-20
Beryllium (Be)-Total			97.6		%		80-120	28-JUL-20
Bismuth (Bi)-Total			100.7		%		80-120	28-JUL-20
Boron (B)-Total			95.1		%		80-120	28-JUL-20
Cadmium (Cd)-Total			96.5		%		80-120	28-JUL-20
Calcium (Ca)-Total			95.4		%		80-120	28-JUL-20
Cesium (Cs)-Total			96.5		%		80-120	28-JUL-20
Chromium (Cr)-Total			96.9		%		80-120	28-JUL-20
Cobalt (Co)-Total			95.8		%		80-120	28-JUL-20
Copper (Cu)-Total			97.6		%		80-120	28-JUL-20
Iron (Fe)-Total			93.8		%		80-120	28-JUL-20
Lead (Pb)-Total			98.5		%		80-120	28-JUL-20
Lithium (Li)-Total			94.6		%		80-120	28-JUL-20
Magnesium (Mg)-Total			97.1		%		80-120	28-JUL-20
Manganese (Mn)-Total			98.2		%		80-120	28-JUL-20
Molybdenum (Mo)-Total			100.1		%		80-120	28-JUL-20
Nickel (Ni)-Total			96.1		%		80-120	28-JUL-20
Potassium (K)-Total			98.4		%		80-120	28-JUL-20
Phosphorus (P)-Total			101.1		%		80-120	28-JUL-20
Rubidium (Rb)-Total			99.2		%		80-120	28-JUL-20
Selenium (Se)-Total			94.5		%		80-120	28-JUL-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R5170980							
WG3371342-2 LCS								
Silicon (Si)-Total			95.5		%		80-120	28-JUL-20
Silver (Ag)-Total			95.5		%		80-120	28-JUL-20
Sodium (Na)-Total			96.5		%		80-120	28-JUL-20
Strontium (Sr)-Total			100.9		%		80-120	28-JUL-20
Sulfur (S)-Total			94.0		%		80-120	28-JUL-20
Tellurium (Te)-Total			96.7		%		80-120	28-JUL-20
Thallium (Tl)-Total			100.7		%		80-120	28-JUL-20
Thorium (Th)-Total			96.6		%		80-120	28-JUL-20
Tin (Sn)-Total			96.7		%		80-120	28-JUL-20
Titanium (Ti)-Total			95.1		%		80-120	28-JUL-20
Tungsten (W)-Total			99.5		%		80-120	28-JUL-20
Uranium (U)-Total			100.6		%		80-120	28-JUL-20
Vanadium (V)-Total			98.5		%		80-120	28-JUL-20
Zinc (Zn)-Total			98.4		%		80-120	28-JUL-20
Zirconium (Zr)-Total			93.8		%		80-120	28-JUL-20
WG3371342-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	28-JUL-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	28-JUL-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	28-JUL-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	28-JUL-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	28-JUL-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	28-JUL-20
Boron (B)-Total			<0.010		mg/L		0.01	28-JUL-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	28-JUL-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	28-JUL-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	28-JUL-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	28-JUL-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	28-JUL-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	28-JUL-20
Iron (Fe)-Total			<0.010		mg/L		0.01	28-JUL-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	28-JUL-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	28-JUL-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	28-JUL-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	28-JUL-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R5170980							
WG3371342-1 MB								
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	28-JUL-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	28-JUL-20
Potassium (K)-Total			<0.050		mg/L		0.05	28-JUL-20
Phosphorus (P)-Total			<0.030		mg/L		0.03	28-JUL-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	28-JUL-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	28-JUL-20
Silicon (Si)-Total			<0.10		mg/L		0.1	28-JUL-20
Silver (Ag)-Total			<0.000010		mg/L		0.00001	28-JUL-20
Sodium (Na)-Total			<0.050		mg/L		0.05	28-JUL-20
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	28-JUL-20
Sulfur (S)-Total			<0.50		mg/L		0.5	28-JUL-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	28-JUL-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	28-JUL-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	28-JUL-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	28-JUL-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	28-JUL-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	28-JUL-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	28-JUL-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	28-JUL-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	28-JUL-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	28-JUL-20
NH3-COL-WP	Water							
Batch	R5172873							
WG3374613-6 LCS								
Ammonia, Total (as N)			97.9		%		85-115	30-JUL-20
WG3374613-5 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	30-JUL-20
N02-IC-N-WP	Water							
Batch	R5171947							
WG3369900-10 LCS								
Nitrite (as N)			102.2		%		90-110	24-JUL-20
WG3369900-9 MB								
Nitrite (as N)			<0.010		mg/L		0.01	24-JUL-20
N03-IC-N-WP	Water							

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
N03-IC-N-WP	Water							
Batch	R5171947							
WG3369900-10	LCS							
Nitrate (as N)			98.4		%		90-110	24-JUL-20
WG3369900-9	MB							
Nitrate (as N)			<0.020		mg/L		0.02	24-JUL-20
OG-GRAV-WP	Water							
Batch	R5174085							
WG3372923-2	LCS							
Oil and Grease			97.6		%		70-130	29-JUL-20
WG3372923-1	MB							
Oil and Grease			<5.0		mg/L		5	29-JUL-20
P-T-COL-WP	Water							
Batch	R5171429							
WG3372481-14	LCS							
Phosphorus (P)-Total			97.3		%		80-120	29-JUL-20
WG3372481-13	MB							
Phosphorus (P)-Total			<0.0030		mg/L		0.003	29-JUL-20
PAH-CCME-PPM-WT	Water							
Batch	R5173752							
WG3372501-2	LCS							
1-Methyl Naphthalene			100.2		%		50-150	04-AUG-20
2-Methyl Naphthalene			99.6		%		50-150	04-AUG-20
Acenaphthene			117.3		%		50-150	04-AUG-20
Acenaphthylene			109.1		%		50-150	04-AUG-20
Anthracene			122.9		%		50-150	04-AUG-20
Acridine			115.9		%		50-150	04-AUG-20
Benzo(a)anthracene			127.8		%		50-150	04-AUG-20
Benzo(a)pyrene			110.9		%		50-150	04-AUG-20
Benzo(b&j)fluoranthene			115.2		%		50-150	04-AUG-20
Benzo(g,h,i)perylene			105.2		%		50-150	04-AUG-20
Benzo(k)fluoranthene			106.2		%		50-150	04-AUG-20
Chrysene			124.8		%		50-150	04-AUG-20
Dibenzo(a,h)anthracene			114.6		%		50-150	04-AUG-20
Fluoranthene			119.6		%		50-150	04-AUG-20
Fluorene			113.0		%		50-150	04-AUG-20
Indeno(1,2,3-cd)pyrene			125.3		%		50-150	04-AUG-20
Naphthalene			96.0		%		50-150	04-AUG-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-CCME-PPM-WT	Water							
Batch	R5173752							
WG3372501-2	LCS							
Phenanthrene			122.3		%		50-150	04-AUG-20
Pyrene			122.0		%		50-150	04-AUG-20
Quinoline			114.7		%		50-150	04-AUG-20
WG3372501-1	MB							
1-Methyl Naphthalene			<0.000020		mg/L		0.00002	04-AUG-20
2-Methyl Naphthalene			<0.000020		mg/L		0.00002	04-AUG-20
Acenaphthene			<0.000020		mg/L		0.00002	04-AUG-20
Acenaphthylene			<0.000020		mg/L		0.00002	04-AUG-20
Anthracene			<0.000010		mg/L		0.00001	04-AUG-20
Acridine			<0.000020		mg/L		0.00002	04-AUG-20
Benzo(a)anthracene			<0.000010		mg/L		0.00001	04-AUG-20
Benzo(a)pyrene			<0.000005C		mg/L		0.000005	04-AUG-20
Benzo(b&j)fluoranthene			<0.000010		mg/L		0.00001	04-AUG-20
Benzo(g,h,i)perylene			<0.000020		mg/L		0.00002	04-AUG-20
Benzo(k)fluoranthene			<0.000010		mg/L		0.00001	04-AUG-20
Chrysene			<0.000020		mg/L		0.00002	04-AUG-20
Dibenzo(a,h)anthracene			<0.000005C		mg/L		0.000005	04-AUG-20
Fluoranthene			<0.000020		mg/L		0.00002	04-AUG-20
Fluorene			<0.000020		mg/L		0.00002	04-AUG-20
Indeno(1,2,3-cd)pyrene			<0.000010		mg/L		0.00001	04-AUG-20
Naphthalene			<0.000050		mg/L		0.00005	04-AUG-20
Phenanthrene			<0.000050		mg/L		0.00005	04-AUG-20
Pyrene			<0.000010		mg/L		0.00001	04-AUG-20
Quinoline			<0.000020		mg/L		0.00002	04-AUG-20
Surrogate: d8-Naphthalene			89.2		%		50-150	04-AUG-20
Surrogate: d10-Phenanthrene			112.5		%		50-150	04-AUG-20
Surrogate: d12-Chrysene			104.2		%		50-150	04-AUG-20
Surrogate: d10-Acenaphthene			108.3		%		50-150	04-AUG-20
Surrogate: d9-Acridine (SS)			104.1		%		50-150	04-AUG-20
PH-WP	Water							
Batch	R5170696							
WG3372669-7	LCS							
pH			7.37		pH units		7.3-7.5	28-JUL-20
PHENOLS-4AAP-WT	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PHENOLS-4AAP-WT	Water							
Batch	R5172855							
WG3372306-2	LCS							
Phenols (4AAP)			102.1		%		85-115	30-JUL-20
WG3372306-1	MB							
Phenols (4AAP)			<0.0010		mg/L		0.001	30-JUL-20
S04-IC-N-WP	Water							
Batch	R5171947							
WG3369900-10	LCS							
Sulfate (SO4)			99.3		%		90-110	24-JUL-20
WG3369900-9	MB							
Sulfate (SO4)			<0.30		mg/L		0.3	24-JUL-20
SOLIDS-TOTSUS-WP	Water							
Batch	R5171385							
WG3371226-2	LCS							
Total Suspended Solids			89.7		%		85-115	28-JUL-20
WG3371226-1	MB							
Total Suspended Solids			<3.0		mg/L		3	28-JUL-20
TC,EC10-QT97-WP	Water							
Batch	R5167588							
WG3370174-1	MB							
Total Coliforms			<1		MPN/100mL		1	24-JUL-20
Escherichia Coli			<1		MPN/100mL		1	24-JUL-20

Quality Control Report

Workorder: L2479347

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Legend:

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

Quality Control Report

Workorder: L2479347

Report Date: 04-AUG-20

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH	1	23-JUL-20 09:30	28-JUL-20 12:00	0.25	122	hours	EHTR-FM
Bacteriological Tests							
Fecal coliforms, 1:10 dilution by QT97	1	23-JUL-20 09:30	24-JUL-20 18:10	30	33	hours	EHTL
Total and E. coli, 1:10 dilution by QT97	1	23-JUL-20 09:30	24-JUL-20 18:10	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 L2479347 were received on 24-JUL-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.

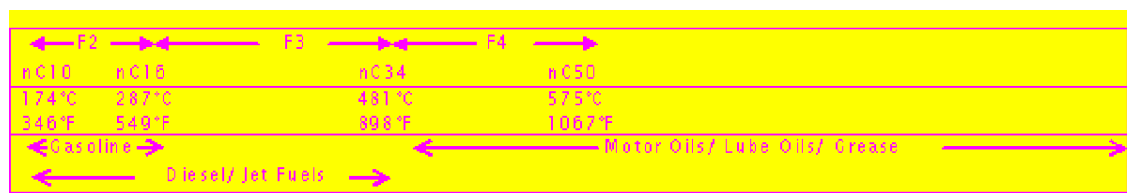
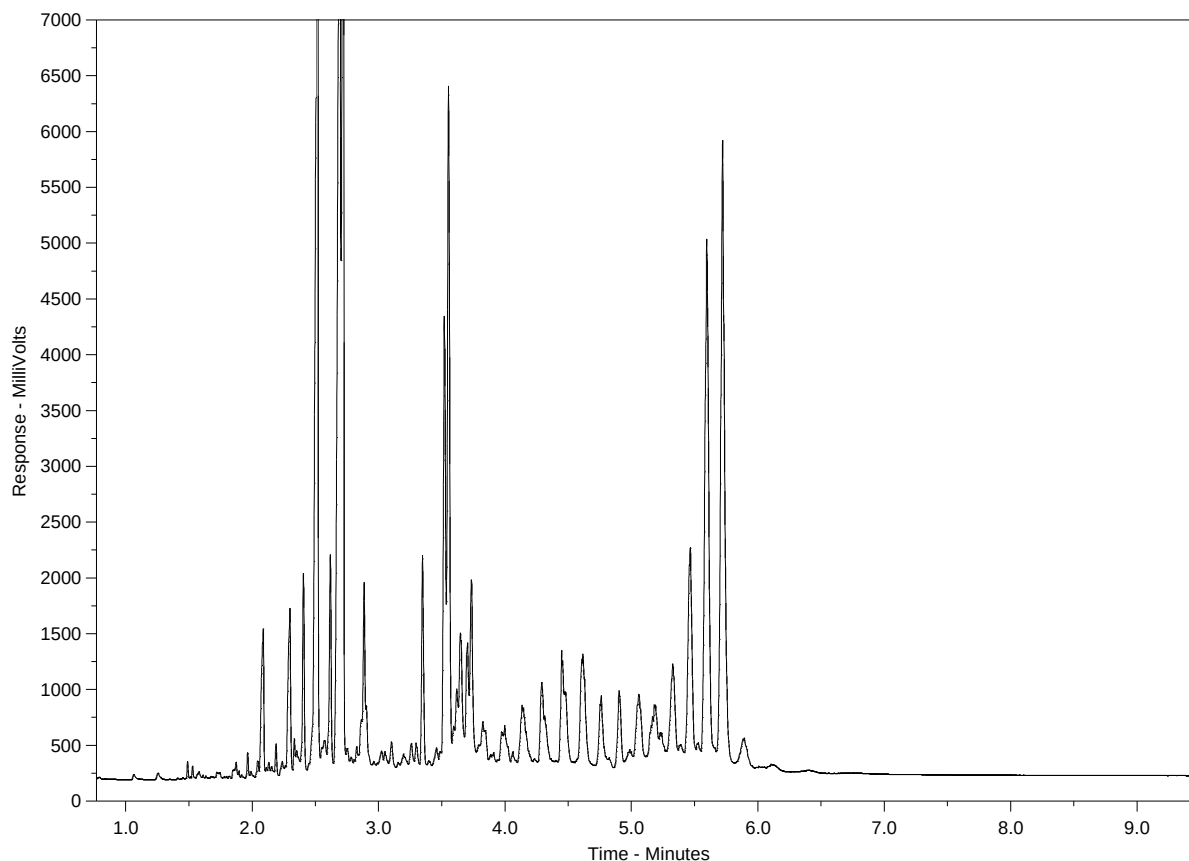
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide 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: L2479347-1
Client Sample ID: RANKIN INLET WWTP - EFFLUENT

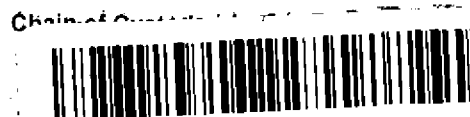


The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

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.

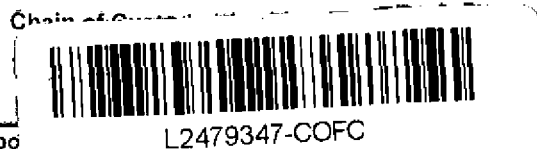
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

COC # L2479347

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Report To		Repo		Service Requested (Rush for routine analysis subject to availability)	
Company: Nunavut CGS - Rankin Inlet (W8133)		☒ Std		☒ 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: <u>sdoiron@gov.nu.ca</u>		☐ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT	
Rankin Inlet, NU, X0C 0G0		Email 2: <u>mlusty@gov.nu.ca</u>		☐ 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:		I.S.D:			
Address:		Quote #:			
Phone:		ALS Contact: Craig Riddell			
Fax:		Sampled By: Simon Doiron			
Lab Work Order # (lab use only)					
Sample #	Sample Identification (This description will appear on the report)	Date Sampled	Time Sampled	Sample Type	Number of Containers
	Rankin Inlet WWTP - Effluent	07/23/20	9:30 AM	Waste	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: Bill Ross	Date (dd-mm-yy): 07/23/20	Time (hh-mm): 9:30	Received by: GE	Date: July 24, 2020	Time: 1:30 AM
				Temperature: 15.5 °C	
				Verified by:	Date:
				Time:	Observations: Yes / No ?
					If Yes add SIF



W2179347

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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-AUG-20
Report Date: 26-AUG-20 09:01 (MT)
Version: FINAL

Client Phone: 867-645-8155

Certificate of Analysis

Lab Work Order #: L2488865
Project P.O. #: NOT SUBMITTED
Job Reference: RANKIN INLET WWTP - MONTHLY EFFLUENT
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 1329 Niakwa Road East, Unit 12, Winnipeg, MB R2J 3T4 Canada | Phone: +1 204 255 9720 | Fax: +1 204 255 9721
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2488865-1 RANKIN INLET WWTP - EFFLUENT Sampled By: CLIENT on 13-AUG-20 @ 09:30 Matrix: WASTE BTEX plus F1-F4 BTX plus F1 by GCMS							
Benzene	<0.00050	VOCHS	0.00050	mg/L		18-AUG-20	R5191010
Toluene	<0.0010	VOCHS	0.0010	mg/L		18-AUG-20	R5191010
Ethyl benzene	<0.00050	VOCHS	0.00050	mg/L		18-AUG-20	R5191010
o-Xylene	<0.00050	VOCHS	0.00050	mg/L		18-AUG-20	R5191010
m+p-Xylenes	<0.00040	VOCHS	0.00040	mg/L		18-AUG-20	R5191010
F1 (C6-C10)	<0.10	VOCHS	0.10	mg/L		18-AUG-20	R5191010
Surrogate: 4-Bromofluorobenzene (SS)	88.8		70-130	%		18-AUG-20	R5191010
CCME PHC F2-F4 in Water							
F2 (C10-C16)	0.70		0.10	mg/L	19-AUG-20	19-AUG-20	R5192163
F3 (C16-C34)	12.3		0.25	mg/L	19-AUG-20	19-AUG-20	R5192163
F4 (C34-C50)	4.24		0.25	mg/L	19-AUG-20	19-AUG-20	R5192163
Surrogate: 2-Bromobenzotrifluoride	93.2		60-140	%	19-AUG-20	19-AUG-20	R5192163
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		20-AUG-20	
F2-Naphth	0.70		0.10	mg/L		20-AUG-20	
F3-PAH	12.3		0.25	mg/L		20-AUG-20	
Total Hydrocarbons (C6-C50)	17.2		0.38	mg/L		20-AUG-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		19-AUG-20	
Miscellaneous Parameters							
Fluoride (F)	0.11		0.10	mg/L		14-AUG-20	R5191585
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	>24200		10	MPN/100mL		14-AUG-20	R5189540
Escherichia Coli	>24200		10	MPN/100mL		14-AUG-20	R5189540
CCME PAHs in mg/L							
1-Methyl Naphthalene	0.000037		0.000020	mg/L	17-AUG-20	19-AUG-20	R5191510
2-Methyl Naphthalene	0.000046		0.000020	mg/L	17-AUG-20	19-AUG-20	R5191510
Acenaphthene	<0.000020		0.000020	mg/L	17-AUG-20	19-AUG-20	R5191510
Acenaphthylene	<0.000020		0.000020	mg/L	17-AUG-20	19-AUG-20	R5191510
Anthracene	<0.000010		0.000010	mg/L	17-AUG-20	19-AUG-20	R5191510
Acridine	<0.000020		0.000020	mg/L	17-AUG-20	19-AUG-20	R5191510
Benzo(a)anthracene	<0.000010		0.000010	mg/L	17-AUG-20	19-AUG-20	R5191510
Benzo(a)pyrene	<0.0000260	DLM	0.000026	mg/L	17-AUG-20	19-AUG-20	R5191510
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	17-AUG-20	19-AUG-20	R5191510
Benzo(g,h,i)perylene	0.000031		0.000020	mg/L	17-AUG-20	19-AUG-20	R5191510
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	17-AUG-20	19-AUG-20	R5191510
Chrysene	<0.000020		0.000020	mg/L	17-AUG-20	19-AUG-20	R5191510
Dibenzo(a,h)anthracene	0.0000233		0.0000050	mg/L	17-AUG-20	19-AUG-20	R5191510
Fluoranthene	<0.000020		0.000020	mg/L	17-AUG-20	19-AUG-20	R5191510
Fluorene	<0.000040	DLM	0.000040	mg/L	17-AUG-20	19-AUG-20	R5191510
Indeno(1,2,3-cd)pyrene	0.000249		0.000010	mg/L	17-AUG-20	19-AUG-20	R5191510
Naphthalene	<0.000050		0.000050	mg/L	17-AUG-20	19-AUG-20	R5191510
Phenanthrene	<0.000050		0.000050	mg/L	17-AUG-20	19-AUG-20	R5191510
Pyrene	<0.000010		0.000010	mg/L	17-AUG-20	19-AUG-20	R5191510
Quinoline	<0.000032	DLM	0.000032	mg/L	17-AUG-20	19-AUG-20	R5191510
B(a)P Total Potency Equivalent	0.000076		0.000030	mg/L	17-AUG-20	19-AUG-20	R5191510
Surrogate: d8-Naphthalene	136.3		50-150	%	17-AUG-20	19-AUG-20	R5191510
Surrogate: d10-Phenanthrene	103.6		50-150	%	17-AUG-20	19-AUG-20	R5191510
Surrogate: d12-Chrysene	114.6		50-150	%	17-AUG-20	19-AUG-20	R5191510
Surrogate: d10-Acenaphthene	98.8		50-150	%	17-AUG-20	19-AUG-20	R5191510
Surrogate: d9-Acridine (SS)	113.9		50-150	%	17-AUG-20	19-AUG-20	R5191510

* 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
L2488865-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: CLIENT on 13-AUG-20 @ 09:30							
Matrix: WASTE							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	165		1.2	mg/L		17-AUG-20	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		17-AUG-20	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		17-AUG-20	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	135		1.0	mg/L		14-AUG-20	R5189987
Ammonia by colour							
Ammonia, Total (as N)	13.6		1.0	mg/L		19-AUG-20	R5192476
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	123		20	mg/L		14-AUG-20	R5192227
Carbonaceous BOD							
BOD Carbonaceous	112		20	mg/L		14-AUG-20	R5192227
Chloride in Water by IC							
Chloride (Cl)	47.2		2.5	mg/L		14-AUG-20	R5191585
Conductivity							
Conductivity	472		1.0	umhos/cm		14-AUG-20	R5189987
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	>24200		10	MPN/100mL		14-AUG-20	R5189547
Hardness Calculated							
Hardness (as CaCO3)	71.5	HTC	0.20	mg/L		20-AUG-20	
Mercury Total							
Mercury (Hg)-Total	0.0000130		0.0000050	mg/L	19-AUG-20	19-AUG-20	R5191880
Nitrate in Water by IC							
Nitrate (as N)	<0.10	DLM	0.10	mg/L		14-AUG-20	R5191585
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.11		0.11	mg/L		26-AUG-20	
Nitrite in Water by IC							
Nitrite (as N)	<0.050	DLM	0.050	mg/L		14-AUG-20	R5191585
Oil & Grease - Gravimetric							
Oil and Grease	40.8		5.0	mg/L		22-AUG-20	R5196980
Phenol (4AAP)							
Phenols (4AAP)	0.0182	DLM	0.0050	mg/L		17-AUG-20	R5190796
Phosphorus, Total							
Phosphorus (P)-Total	4.28		0.015	mg/L		19-AUG-20	R5191467
Sulfate in Water by IC							
Sulfate (SO4)	21.2		1.5	mg/L		14-AUG-20	R5191585
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.763		0.0030	mg/L	18-AUG-20	19-AUG-20	R5192665
Antimony (Sb)-Total	0.00021		0.00010	mg/L	18-AUG-20	19-AUG-20	R5192665
Arsenic (As)-Total	0.00110		0.00010	mg/L	18-AUG-20	19-AUG-20	R5192665
Barium (Ba)-Total	0.0213		0.00010	mg/L	18-AUG-20	19-AUG-20	R5192665
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	18-AUG-20	19-AUG-20	R5192665
Bismuth (Bi)-Total	0.00598		0.000050	mg/L	18-AUG-20	19-AUG-20	R5192665
Boron (B)-Total	0.074		0.010	mg/L	18-AUG-20	19-AUG-20	R5192665
Cadmium (Cd)-Total	0.0000778		0.0000050	mg/L	18-AUG-20	19-AUG-20	R5192665
Calcium (Ca)-Total	19.7		0.050	mg/L	18-AUG-20	19-AUG-20	R5192665
Cesium (Cs)-Total	0.000083		0.000010	mg/L	18-AUG-20	19-AUG-20	R5192665
Chromium (Cr)-Total	0.00127		0.00010	mg/L	18-AUG-20	19-AUG-20	R5192665
Cobalt (Co)-Total	0.00029		0.00010	mg/L	18-AUG-20	19-AUG-20	R5192665
Copper (Cu)-Total	0.180		0.00050	mg/L	18-AUG-20	19-AUG-20	R5192665

* 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
L2488865-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: CLIENT on 13-AUG-20 @ 09:30							
Matrix: WASTE							
Total Metals in Water by CRC ICPMS							
Iron (Fe)-Total	0.469		0.010	mg/L	18-AUG-20	19-AUG-20	R5192665
Lead (Pb)-Total	0.00137		0.000050	mg/L	18-AUG-20	19-AUG-20	R5192665
Lithium (Li)-Total	0.0023		0.0010	mg/L	18-AUG-20	19-AUG-20	R5192665
Magnesium (Mg)-Total	5.39		0.0050	mg/L	18-AUG-20	19-AUG-20	R5192665
Manganese (Mn)-Total	0.0479		0.00010	mg/L	18-AUG-20	19-AUG-20	R5192665
Molybdenum (Mo)-Total	0.000979		0.000050	mg/L	18-AUG-20	19-AUG-20	R5192665
Nickel (Ni)-Total	0.00286		0.00050	mg/L	18-AUG-20	19-AUG-20	R5192665
Potassium (K)-Total	9.11		0.050	mg/L	18-AUG-20	19-AUG-20	R5192665
Phosphorus (P)-Total	4.32		0.030	mg/L	18-AUG-20	19-AUG-20	R5192665
Rubidium (Rb)-Total	0.00922		0.00020	mg/L	18-AUG-20	19-AUG-20	R5192665
Selenium (Se)-Total	0.000421		0.000050	mg/L	18-AUG-20	19-AUG-20	R5192665
Silicon (Si)-Total	0.78		0.10	mg/L	18-AUG-20	19-AUG-20	R5192665
Silver (Ag)-Total	0.000048		0.000010	mg/L	18-AUG-20	19-AUG-20	R5192665
Sodium (Na)-Total	33.0		0.050	mg/L	18-AUG-20	19-AUG-20	R5192665
Strontium (Sr)-Total	0.0849		0.00020	mg/L	18-AUG-20	19-AUG-20	R5192665
Sulfur (S)-Total	10.1		0.50	mg/L	18-AUG-20	19-AUG-20	R5192665
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	18-AUG-20	19-AUG-20	R5192665
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	18-AUG-20	19-AUG-20	R5192665
Thorium (Th)-Total	<0.00010		0.00010	mg/L	18-AUG-20	19-AUG-20	R5192665
Tin (Sn)-Total	0.00086		0.00010	mg/L	18-AUG-20	19-AUG-20	R5192665
Titanium (Ti)-Total	0.0876		0.00030	mg/L	18-AUG-20	19-AUG-20	R5192665
Tungsten (W)-Total	<0.00010		0.00010	mg/L	18-AUG-20	19-AUG-20	R5192665
Uranium (U)-Total	0.000207		0.000010	mg/L	18-AUG-20	19-AUG-20	R5192665
Vanadium (V)-Total	0.00083		0.00050	mg/L	18-AUG-20	19-AUG-20	R5192665
Zinc (Zn)-Total	0.139		0.0030	mg/L	18-AUG-20	19-AUG-20	R5192665
Zirconium (Zr)-Total	0.00116		0.00020	mg/L	18-AUG-20	19-AUG-20	R5192665
Total Organic Carbon by Combustion							
Total Organic Carbon	78.0		5.0	mg/L		20-AUG-20	R5195159
Total Suspended Solids							
Total Suspended Solids	127		3.0	mg/L		18-AUG-20	R5191691
pH							
pH	7.37		0.10	pH units		14-AUG-20	R5189987

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
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 transferred 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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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.			
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)

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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
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 aqueous 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 Substrate 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 ww - 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.

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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	R5189987							
WG3384716-14	LCS							
Alkalinity, Total (as CaCO ₃)			106.6		%		85-115	14-AUG-20
WG3384716-11	MB							
Alkalinity, Total (as CaCO ₃)			<1.0		mg/L		1	14-AUG-20
BOD-CBOD-WP	Water							
Batch	R5192227							
WG3383674-7	LCS							
BOD Carbonaceous			100.2		%		85-115	14-AUG-20
WG3383674-6	MB							
BOD Carbonaceous			<2.0		mg/L		2	14-AUG-20
BOD-WP	Water							
Batch	R5192227							
WG3383674-7	LCS							
Biochemical Oxygen Demand			105.4		%		85-115	14-AUG-20
WG3383674-6	MB							
Biochemical Oxygen Demand			<2.0		mg/L		2	14-AUG-20
BTEXS+F1-HSMS-WP	Water							
Batch	R5191010							
WG3385010-2	LCS							
Benzene			108.7		%		70-130	17-AUG-20
Toluene			105.9		%		70-130	17-AUG-20
Ethyl benzene			105.2		%		70-130	17-AUG-20
o-Xylene			113.4		%		70-130	17-AUG-20
m+p-Xylenes			106.7		%		70-130	17-AUG-20
WG3385010-3	LCS							
F1 (C6-C10)			121.6		%		70-130	17-AUG-20
WG3385010-1	MB							
Benzene			<0.00050		mg/L		0.0005	17-AUG-20
Toluene			<0.0010		mg/L		0.001	17-AUG-20
Ethyl benzene			<0.00050		mg/L		0.0005	17-AUG-20
o-Xylene			<0.00050		mg/L		0.0005	17-AUG-20
m+p-Xylenes			<0.00040		mg/L		0.0004	17-AUG-20
F1 (C6-C10)			<0.10		mg/L		0.1	17-AUG-20
Surrogate: 4-Bromofluorobenzene (SS)			92.3		%		70-130	17-AUG-20
C-TOC-HTC-WP	Water							

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-TOC-HTC-WP	Water							
Batch	R5195159							
WG3388287-2	LCS							
Total Organic Carbon			107.0		%		80-120	20-AUG-20
WG3388287-1	MB							
Total Organic Carbon			<0.50		mg/L		0.5	20-AUG-20
CL-IC-N-WP	Water							
Batch	R5191585							
WG3383706-10	LCS							
Chloride (Cl)			98.1		%		90-110	14-AUG-20
WG3383706-9	MB							
Chloride (Cl)			<0.50		mg/L		0.5	14-AUG-20
E C-WP	Water							
Batch	R5189987							
WG3384716-13	LCS							
Conductivity			96.9		%		90-110	14-AUG-20
WG3384716-11	MB							
Conductivity			<1.0		umhos/cm		1	14-AUG-20
F-IC-N-WP	Water							
Batch	R5191585							
WG3383706-10	LCS							
Fluoride (F)			98.4		%		90-110	14-AUG-20
WG3383706-9	MB							
Fluoride (F)			<0.020		mg/L		0.02	14-AUG-20
F2-F4-FID-WP	Water							
Batch	R5192163							
WG3386820-2	LCS							
F2 (C10-C16)			100.2		%		70-130	19-AUG-20
F3 (C16-C34)			99.0		%		70-130	19-AUG-20
F4 (C34-C50)			105.1		%		70-130	19-AUG-20
WG3386820-1	MB							
F2 (C10-C16)			<0.10		mg/L		0.1	19-AUG-20
F3 (C16-C34)			<0.25		mg/L		0.25	19-AUG-20
F4 (C34-C50)			<0.25		mg/L		0.25	19-AUG-20
Surrogate: 2-Bromobenzotrifluoride			92.2		%		60-140	19-AUG-20
FC10-QT97-WP	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
FC10-QT97-WP	Water							
Batch	R5189547							
WG3383862-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	14-AUG-20
HG-T-CVAA-WP	Water							
Batch	R5191880							
WG3386927-2 LCS								
Mercury (Hg)-Total			102.0		%		80-120	19-AUG-20
WG3386927-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	19-AUG-20
MET-T-CCMS-WP	Water							
Batch	R5192665							
WG3385704-2 LCS								
Aluminum (Al)-Total			102.6		%		80-120	19-AUG-20
Antimony (Sb)-Total			99.2		%		80-120	19-AUG-20
Arsenic (As)-Total			98.9		%		80-120	19-AUG-20
Barium (Ba)-Total			98.3		%		80-120	19-AUG-20
Beryllium (Be)-Total			101.2		%		80-120	19-AUG-20
Bismuth (Bi)-Total			98.5		%		80-120	19-AUG-20
Boron (B)-Total			100.2		%		80-120	19-AUG-20
Cadmium (Cd)-Total			98.9		%		80-120	19-AUG-20
Calcium (Ca)-Total			94.3		%		80-120	19-AUG-20
Cesium (Cs)-Total			97.4		%		80-120	19-AUG-20
Chromium (Cr)-Total			98.0		%		80-120	19-AUG-20
Cobalt (Co)-Total			98.4		%		80-120	19-AUG-20
Copper (Cu)-Total			101.2		%		80-120	19-AUG-20
Iron (Fe)-Total			98.4		%		80-120	19-AUG-20
Lead (Pb)-Total			100.4		%		80-120	19-AUG-20
Lithium (Li)-Total			101.3		%		80-120	19-AUG-20
Magnesium (Mg)-Total			104.1		%		80-120	19-AUG-20
Manganese (Mn)-Total			99.9		%		80-120	19-AUG-20
Molybdenum (Mo)-Total			97.3		%		80-120	19-AUG-20
Nickel (Ni)-Total			98.1		%		80-120	19-AUG-20
Potassium (K)-Total			99.1		%		80-120	19-AUG-20
Phosphorus (P)-Total			110.0		%		80-120	19-AUG-20
Rubidium (Rb)-Total			96.7		%		80-120	19-AUG-20
Selenium (Se)-Total			98.7		%		80-120	19-AUG-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R5192665							
WG3385704-2	LCS							
Silicon (Si)-Total			103.8		%		80-120	19-AUG-20
Silver (Ag)-Total			97.6		%		80-120	19-AUG-20
Sodium (Na)-Total			98.6		%		80-120	19-AUG-20
Strontium (Sr)-Total			100.7		%		80-120	19-AUG-20
Sulfur (S)-Total			98.6		%		80-120	19-AUG-20
Tellurium (Te)-Total			96.0		%		80-120	19-AUG-20
Thallium (Tl)-Total			100.8		%		80-120	19-AUG-20
Thorium (Th)-Total			95.8		%		80-120	19-AUG-20
Tin (Sn)-Total			97.5		%		80-120	19-AUG-20
Titanium (Ti)-Total			95.3		%		80-120	19-AUG-20
Tungsten (W)-Total			98.7		%		80-120	19-AUG-20
Uranium (U)-Total			98.6		%		80-120	19-AUG-20
Vanadium (V)-Total			97.8		%		80-120	19-AUG-20
Zinc (Zn)-Total			103.1		%		80-120	19-AUG-20
Zirconium (Zr)-Total			92.1		%		80-120	19-AUG-20
WG3385704-1	MB							
Aluminum (Al)-Total			<0.0030		mg/L		0.003	19-AUG-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	19-AUG-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	19-AUG-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	19-AUG-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	19-AUG-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	19-AUG-20
Boron (B)-Total			<0.010		mg/L		0.01	19-AUG-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	19-AUG-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	19-AUG-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	19-AUG-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	19-AUG-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	19-AUG-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	19-AUG-20
Iron (Fe)-Total			<0.010		mg/L		0.01	19-AUG-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	19-AUG-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	19-AUG-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	19-AUG-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	19-AUG-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R5192665							
WG3385704-1 MB								
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	19-AUG-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	19-AUG-20
Potassium (K)-Total			<0.050		mg/L		0.05	19-AUG-20
Phosphorus (P)-Total			<0.030		mg/L		0.03	19-AUG-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	19-AUG-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	19-AUG-20
Silicon (Si)-Total			<0.10		mg/L		0.1	19-AUG-20
Silver (Ag)-Total			<0.000010		mg/L		0.00001	19-AUG-20
Sodium (Na)-Total			<0.050		mg/L		0.05	19-AUG-20
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	19-AUG-20
Sulfur (S)-Total			<0.50		mg/L		0.5	19-AUG-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	19-AUG-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	19-AUG-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	19-AUG-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	19-AUG-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	19-AUG-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	19-AUG-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	19-AUG-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	19-AUG-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	19-AUG-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	19-AUG-20
NH3-COL-WP	Water							
Batch	R5192476							
WG3387464-14 LCS								
Ammonia, Total (as N)			98.9		%		85-115	19-AUG-20
WG3387464-13 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	19-AUG-20
N02-IC-N-WP	Water							
Batch	R5191585							
WG3383706-10 LCS								
Nitrite (as N)			102.2		%		90-110	14-AUG-20
WG3383706-9 MB								
Nitrite (as N)			<0.010		mg/L		0.01	14-AUG-20
N03-IC-N-WP	Water							

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
N03-IC-N-WP	Water							
Batch	R5191585							
WG3383706-10	LCS							
Nitrate (as N)			97.8		%		90-110	14-AUG-20
WG3383706-9	MB							
Nitrate (as N)			<0.020		mg/L		0.02	14-AUG-20
OG-GRAV-WP	Water							
Batch	R5196980							
WG3386841-2	LCS							
Oil and Grease			99.4		%		70-130	22-AUG-20
WG3386841-1	MB							
Oil and Grease			<5.0		mg/L		5	22-AUG-20
P-T-COL-WP	Water							
Batch	R5191467							
WG3386454-10	LCS							
Phosphorus (P)-Total			98.0		%		80-120	19-AUG-20
WG3386454-9	MB							
Phosphorus (P)-Total			<0.0030		mg/L		0.003	19-AUG-20
PAH-CCME-PPM-WT	Water							
Batch	R5191510							
WG3385175-2	LCS							
1-Methyl Naphthalene			100.5		%		50-150	19-AUG-20
2-Methyl Naphthalene			99.5		%		50-150	19-AUG-20
Acenaphthene			107.1		%		50-150	19-AUG-20
Acenaphthylene			103.3		%		50-150	19-AUG-20
Anthracene			106.4		%		50-150	19-AUG-20
Acridine			105.1		%		50-150	19-AUG-20
Benzo(a)anthracene			110.7		%		50-150	19-AUG-20
Benzo(a)pyrene			91.8		%		50-150	19-AUG-20
Benzo(b&j)fluoranthene			92.2		%		50-150	19-AUG-20
Benzo(g,h,i)perylene			89.0		%		50-150	19-AUG-20
Benzo(k)fluoranthene			86.6		%		50-150	19-AUG-20
Chrysene			100.9		%		50-150	19-AUG-20
Dibenzo(a,h)anthracene			93.3		%		50-150	19-AUG-20
Fluoranthene			102.3		%		50-150	19-AUG-20
Fluorene			105.3		%		50-150	19-AUG-20
Indeno(1,2,3-cd)pyrene			101.5		%		50-150	19-AUG-20
Naphthalene			99.4		%		50-150	19-AUG-20



Quality Control Report

Workorder: L2488865

Report Date: 26-AUG-20

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-CCME-PPM-WT	Water							
Batch	R5191510							
WG3385175-2	LCS							
Phenanthrene			110.1		%		50-150	19-AUG-20
Pyrene			104.1		%		50-150	19-AUG-20
Quinoline			103.4		%		50-150	19-AUG-20
WG3385175-1	MB							
1-Methyl Naphthalene			<0.000020		mg/L		0.00002	19-AUG-20
2-Methyl Naphthalene			<0.000020		mg/L		0.00002	19-AUG-20
Acenaphthene			<0.000020		mg/L		0.00002	19-AUG-20
Acenaphthylene			<0.000020		mg/L		0.00002	19-AUG-20
Anthracene			<0.000010		mg/L		0.00001	19-AUG-20
Acridine			<0.000020		mg/L		0.00002	19-AUG-20
Benzo(a)anthracene			<0.000010		mg/L		0.00001	19-AUG-20
Benzo(a)pyrene			<0.000005C		mg/L		0.000005	19-AUG-20
Benzo(b&j)fluoranthene			<0.000010		mg/L		0.00001	19-AUG-20
Benzo(g,h,i)perylene			<0.000020		mg/L		0.00002	19-AUG-20
Benzo(k)fluoranthene			<0.000010		mg/L		0.00001	19-AUG-20
Chrysene			<0.000020		mg/L		0.00002	19-AUG-20
Dibenzo(a,h)anthracene			<0.000005C		mg/L		0.000005	19-AUG-20
Fluoranthene			<0.000020		mg/L		0.00002	19-AUG-20
Fluorene			<0.000020		mg/L		0.00002	19-AUG-20
Indeno(1,2,3-cd)pyrene			<0.000010		mg/L		0.00001	19-AUG-20
Naphthalene			<0.000050		mg/L		0.00005	19-AUG-20
Phenanthrene			<0.000050		mg/L		0.00005	19-AUG-20
Pyrene			<0.000010		mg/L		0.00001	19-AUG-20
Quinoline			<0.000020		mg/L		0.00002	19-AUG-20
Surrogate: d8-Naphthalene			93.5		%		50-150	19-AUG-20
Surrogate: d10-Phenanthrene			103.6		%		50-150	19-AUG-20
Surrogate: d12-Chrysene			104.0		%		50-150	19-AUG-20
Surrogate: d10-Acenaphthene			96.4		%		50-150	19-AUG-20
Surrogate: d9-Acridine (SS)			102.7		%		50-150	19-AUG-20
PH-WP	Water							
Batch	R5189987							
WG3384716-12	LCS							
pH			7.35		pH units		7.3-7.5	14-AUG-20
PHENOLS-4AAP-WT	Water							



Quality Control Report

Workorder: L2488865

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PHENOLS-4AAP-WT	Water							
Batch R5190796								
WG3384313-2 LCS								
Phenols (4AAP)			102.1		%		85-115	17-AUG-20
WG3384313-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	17-AUG-20
S04-IC-N-WP	Water							
Batch R5191585								
WG3383706-10 LCS								
Sulfate (SO4)			99.3		%		90-110	14-AUG-20
WG3383706-9 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	14-AUG-20
SOLIDS-TOTSUS-WP	Water							
Batch R5191691								
WG3385246-2 LCS								
Total Suspended Solids			97.4		%		85-115	18-AUG-20
WG3385246-1 MB								
Total Suspended Solids			<3.0		mg/L		3	18-AUG-20
TC,EC10-QT97-WP	Water							
Batch R5189540								
WG3383872-2 DUP		L2488865-1						
Total Coliforms		>24200	>24200		MPN/100mL	0.0	65	14-AUG-20
Escherichia Coli		>24200	>24200		MPN/100mL	0.0	65	14-AUG-20
WG3383872-1 MB								
Total Coliforms			<1		MPN/100mL		1	14-AUG-20
Escherichia Coli			<1		MPN/100mL		1	14-AUG-20

Quality Control Report

Workorder: L2488865

Report Date: 26-AUG-20

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Legend:

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

Quality Control Report

Workorder: L2488865

Report Date: 26-AUG-20

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH	1	13-AUG-20 09:30	14-AUG-20 12:00	0.25	26	hours	EHTR-FM

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 L2488865 were received on 14-AUG-20 11:50.

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.

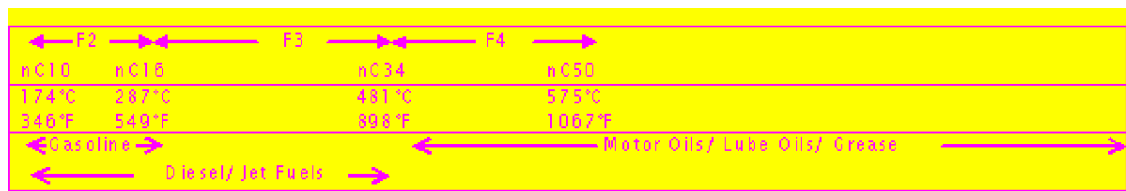
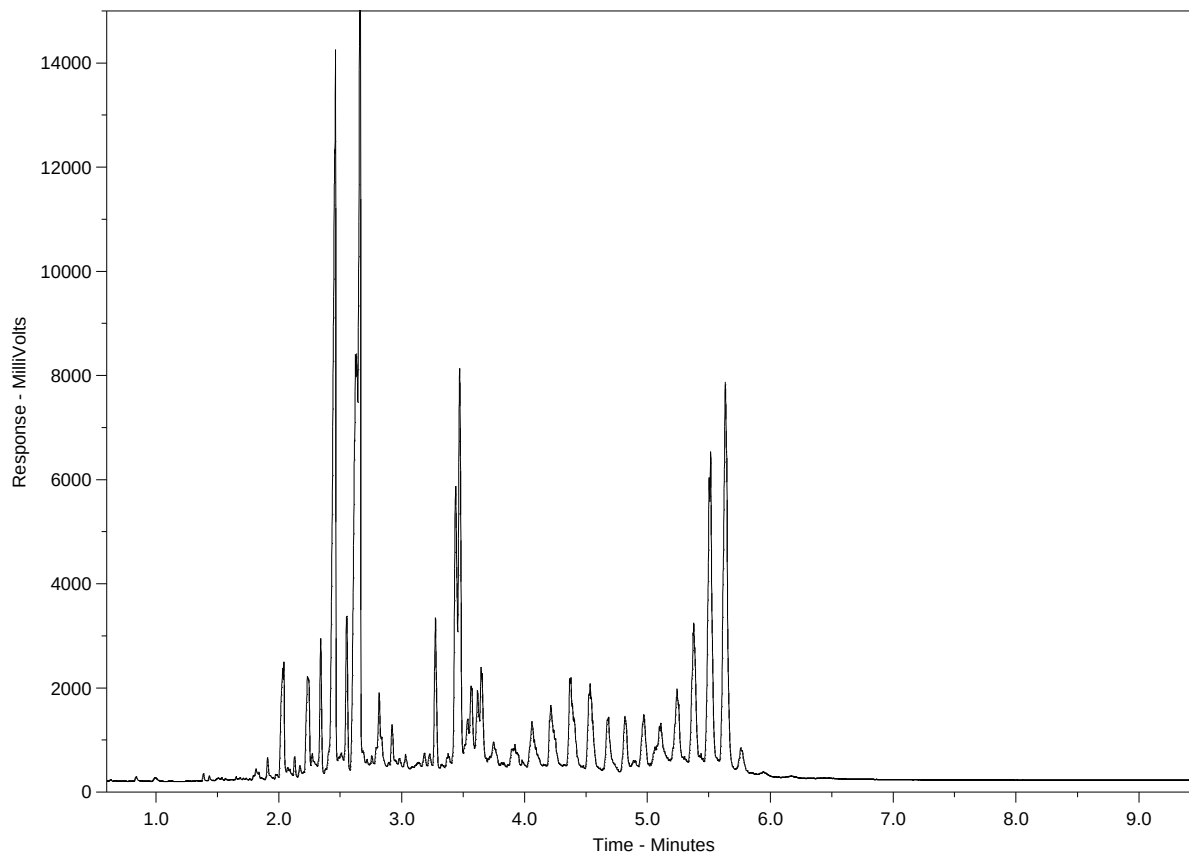
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide 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: L2488865-1
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.



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

Date Received: 03-SEP-20
Report Date: 16-SEP-20 11:49 (MT)
Version: FINAL

Client Phone: 867-645-8155

Certificate of Analysis

Lab Work Order #: L2498415

Project P.O. #: NOT SUBMITTED

Job Reference: RANKIN INLET WWTP - MONTHLY EFFLUENT

C of C Numbers:

Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2498415-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 02-SEP-20 @ 10:00							
Matrix: WASTE							
BTEX							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		11-SEP-20	R5222012
Toluene	<0.0010		0.0010	mg/L		11-SEP-20	R5222012
Ethyl benzene	<0.00050		0.00050	mg/L		11-SEP-20	R5222012
o-Xylene	<0.00050		0.00050	mg/L		11-SEP-20	R5222012
m+p-Xylenes	<0.00040		0.00040	mg/L		11-SEP-20	R5222012
F1 (C6-C10)	<0.10		0.10	mg/L		11-SEP-20	R5222012
Surrogate: 4-Bromofluorobenzene (SS)	103.2		70-130	%		11-SEP-20	R5222012
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		14-SEP-20	
F2-Naphth	<0.10		0.10	mg/L		14-SEP-20	
F3-PAH	1.11		0.25	mg/L		14-SEP-20	
Total Hydrocarbons (C6-C50)	1.88		0.38	mg/L		14-SEP-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		14-SEP-20	
Miscellaneous Parameters							
Fluoride (F)	0.176		0.020	mg/L		03-SEP-20	R5219940
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	>24200		10	MPN/100mL		03-SEP-20	R5210366
Escherichia Coli	>24200		10	MPN/100mL		03-SEP-20	R5210366
F2-F4 (O.Reg.153/04)							
F2 (C10-C16)	<100		100	ug/L	08-SEP-20	10-SEP-20	R5221477
F3 (C16-C34)	1110		250	ug/L	08-SEP-20	10-SEP-20	R5221477
F4 (C34-C50)	770		250	ug/L	08-SEP-20	10-SEP-20	R5221477
Chrom. to baseline at nC50	YES				08-SEP-20	10-SEP-20	R5221477
Surrogate: 2-Bromobenzotrifluoride	97.4		60-140	%	08-SEP-20	10-SEP-20	R5221477
CCME PAHs in mg/L							
1-Methyl Naphthalene	0.000030		0.000020	mg/L	08-SEP-20	14-SEP-20	R5222941
2-Methyl Naphthalene	0.000038		0.000020	mg/L	08-SEP-20	14-SEP-20	R5222941
Acenaphthene	<0.000020		0.000020	mg/L	08-SEP-20	14-SEP-20	R5222941
Acenaphthylene	<0.000020		0.000020	mg/L	08-SEP-20	14-SEP-20	R5222941
Anthracene	<0.000010		0.000010	mg/L	08-SEP-20	14-SEP-20	R5222941
Acridine	<0.000020		0.000020	mg/L	08-SEP-20	14-SEP-20	R5222941
Benzo(a)anthracene	<0.000010		0.000010	mg/L	08-SEP-20	14-SEP-20	R5222941
Benzo(a)pyrene	0.0000059		0.0000050	mg/L	08-SEP-20	14-SEP-20	R5222941
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	08-SEP-20	14-SEP-20	R5222941
Benzo(g,h,i)perylene	<0.000042	DLQ	0.000042	mg/L	08-SEP-20	14-SEP-20	R5222941
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	08-SEP-20	14-SEP-20	R5222941
Chrysene	<0.000020		0.000020	mg/L	08-SEP-20	14-SEP-20	R5222941
Dibenzo(a,h)anthracene	<0.0000240	DLQ	0.000024	mg/L	08-SEP-20	14-SEP-20	R5222941
Fluoranthene	<0.000020		0.000020	mg/L	08-SEP-20	14-SEP-20	R5222941
Fluorene	<0.000044	DLQ	0.000044	mg/L	08-SEP-20	14-SEP-20	R5222941
Indeno(1,2,3-cd)pyrene	<0.000330	DLQ	0.00033	mg/L	08-SEP-20	14-SEP-20	R5222941
Naphthalene	<0.000050		0.000050	mg/L	08-SEP-20	14-SEP-20	R5222941
Phenanthrene	<0.000050		0.000050	mg/L	08-SEP-20	14-SEP-20	R5222941
Pyrene	<0.000010		0.000010	mg/L	08-SEP-20	14-SEP-20	R5222941
Quinoline	<0.000040	DLQ	0.000040	mg/L	08-SEP-20	14-SEP-20	R5222941
B(a)P Total Potency Equivalent	0.000063		0.000030	mg/L	08-SEP-20	14-SEP-20	R5222941
Surrogate: d8-Naphthalene	111.8		50-150	%	08-SEP-20	14-SEP-20	R5222941
Surrogate: d10-Phenanthrene	102.9		50-150	%	08-SEP-20	14-SEP-20	R5222941
Surrogate: d12-Chrysene	99.7		50-150	%	08-SEP-20	14-SEP-20	R5222941
Surrogate: d10-Acenaphthene	95.1		50-150	%	08-SEP-20	14-SEP-20	R5222941

* 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
L2498415-1 RANKIN INLET WWTP - EFFLUENT Sampled By: SD on 02-SEP-20 @ 10:00 Matrix: WASTE							
CCME PAHs in mg/L Surrogate: d9-Acridine (SS)	108.5		50-150	%	08-SEP-20	14-SEP-20	R5222941
Nunavut WW Group 1							
Alkalinity, Bicarbonate Bicarbonate (HCO3)	130		1.2	mg/L		08-SEP-20	
Alkalinity, Carbonate Carbonate (CO3)	<0.60		0.60	mg/L		08-SEP-20	
Alkalinity, Hydroxide Hydroxide (OH)	<0.34		0.34	mg/L		08-SEP-20	
Alkalinity, Total (as CaCO3) Alkalinity, Total (as CaCO3)	106		1.0	mg/L		04-SEP-20	R5214576
Ammonia by colour Ammonia, Total (as N)	7.88		0.50	mg/L		03-SEP-20	R5209846
Biochemical Oxygen Demand (BOD) Biochemical Oxygen Demand	116		20	mg/L		04-SEP-20	R5221796
Carbonaceous BOD BOD Carbonaceous	104		20	mg/L		04-SEP-20	R5221796
Chloride in Water by IC Chloride (Cl)	63.4		0.50	mg/L		03-SEP-20	R5219940
Conductivity Conductivity	468		1.0	umhos/cm		04-SEP-20	R5214576
Fecal coliforms, 1:10 dilution by QT97 Fecal Coliforms	>24200		10	MPN/100mL		03-SEP-20	R5210357
Hardness Calculated Hardness (as CaCO3)	93.5	HTC	0.20	mg/L		09-SEP-20	
Mercury Total Mercury (Hg)-Total	0.0000110		0.0000050	mg/L	09-SEP-20	09-SEP-20	R5220263
Nitrate in Water by IC Nitrate (as N)	<0.020		0.020	mg/L		03-SEP-20	R5219940
Nitrate+Nitrite Nitrate and Nitrite as N	<0.070		0.070	mg/L		10-SEP-20	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		03-SEP-20	R5219940
Oil & Grease - Gravimetric Oil and Grease	2170		5.0	mg/L		16-SEP-20	R5224524
Phenol (4AAP) Phenols (4AAP)	<0.010	DLM	0.010	mg/L		10-SEP-20	R5222027
Phosphorus, Total Phosphorus (P)-Total	2.50		0.030	mg/L		09-SEP-20	R5217437
Sulfate in Water by IC Sulfate (SO4)	26.0		0.30	mg/L		03-SEP-20	R5219940
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.290		0.0030	mg/L	08-SEP-20	08-SEP-20	R5217407
Antimony (Sb)-Total	0.00020		0.00010	mg/L	08-SEP-20	08-SEP-20	R5217407
Arsenic (As)-Total	0.00181		0.00010	mg/L	08-SEP-20	08-SEP-20	R5217407
Barium (Ba)-Total	0.0285		0.00010	mg/L	08-SEP-20	08-SEP-20	R5217407
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	08-SEP-20	08-SEP-20	R5217407
Bismuth (Bi)-Total	0.00947		0.000050	mg/L	08-SEP-20	08-SEP-20	R5217407
Boron (B)-Total	0.082		0.010	mg/L	08-SEP-20	08-SEP-20	R5217407
Cadmium (Cd)-Total	0.0000937		0.0000050	mg/L	08-SEP-20	08-SEP-20	R5217407
Calcium (Ca)-Total	27.0		0.050	mg/L	08-SEP-20	08-SEP-20	R5217407
Cesium (Cs)-Total	0.000093		0.000010	mg/L	08-SEP-20	08-SEP-20	R5217407
Chromium (Cr)-Total	0.00122		0.00010	mg/L	08-SEP-20	08-SEP-20	R5217407

* 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
L2498415-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 02-SEP-20 @ 10:00							
Matrix: WASTE							
Total Metals in Water by CRC ICPMS							
Cobalt (Co)-Total	0.00049		0.00010	mg/L	08-SEP-20	08-SEP-20	R5217407
Copper (Cu)-Total	0.110		0.00050	mg/L	08-SEP-20	08-SEP-20	R5217407
Iron (Fe)-Total	0.600		0.010	mg/L	08-SEP-20	08-SEP-20	R5217407
Lead (Pb)-Total	0.000769		0.000050	mg/L	08-SEP-20	08-SEP-20	R5217407
Lithium (Li)-Total	0.0047		0.0010	mg/L	08-SEP-20	08-SEP-20	R5217407
Magnesium (Mg)-Total	6.31		0.0050	mg/L	08-SEP-20	08-SEP-20	R5217407
Manganese (Mn)-Total	0.0620		0.00010	mg/L	08-SEP-20	08-SEP-20	R5217407
Molybdenum (Mo)-Total	0.000910		0.000050	mg/L	08-SEP-20	08-SEP-20	R5217407
Nickel (Ni)-Total	0.00324		0.00050	mg/L	08-SEP-20	08-SEP-20	R5217407
Potassium (K)-Total	8.08		0.050	mg/L	08-SEP-20	08-SEP-20	R5217407
Phosphorus (P)-Total	2.62		0.030	mg/L	08-SEP-20	08-SEP-20	R5217407
Rubidium (Rb)-Total	0.00898		0.00020	mg/L	08-SEP-20	08-SEP-20	R5217407
Selenium (Se)-Total	0.000281		0.000050	mg/L	08-SEP-20	08-SEP-20	R5217407
Silicon (Si)-Total	1.00		0.10	mg/L	08-SEP-20	08-SEP-20	R5217407
Silver (Ag)-Total	0.000078		0.000010	mg/L	08-SEP-20	08-SEP-20	R5217407
Sodium (Na)-Total	36.7		0.050	mg/L	08-SEP-20	08-SEP-20	R5217407
Strontium (Sr)-Total	0.140		0.00020	mg/L	08-SEP-20	08-SEP-20	R5217407
Sulfur (S)-Total	10.9		0.50	mg/L	08-SEP-20	08-SEP-20	R5217407
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	08-SEP-20	08-SEP-20	R5217407
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	08-SEP-20	08-SEP-20	R5217407
Thorium (Th)-Total	<0.00010		0.00010	mg/L	08-SEP-20	08-SEP-20	R5217407
Tin (Sn)-Total	0.00061		0.00010	mg/L	08-SEP-20	08-SEP-20	R5217407
Titanium (Ti)-Total	0.0157		0.00030	mg/L	08-SEP-20	08-SEP-20	R5217407
Tungsten (W)-Total	<0.00010		0.00010	mg/L	08-SEP-20	08-SEP-20	R5217407
Uranium (U)-Total	0.000245		0.000010	mg/L	08-SEP-20	08-SEP-20	R5217407
Vanadium (V)-Total	0.00120		0.00050	mg/L	08-SEP-20	08-SEP-20	R5217407
Zinc (Zn)-Total	0.0841		0.0030	mg/L	08-SEP-20	08-SEP-20	R5217407
Zirconium (Zr)-Total	0.00088		0.00020	mg/L	08-SEP-20	08-SEP-20	R5217407
Total Organic Carbon by Combustion							
Total Organic Carbon	63.8		0.50	mg/L		11-SEP-20	R5223154
Total Suspended Solids							
Total Suspended Solids	94.2		3.0	mg/L		04-SEP-20	R5214742
pH							
pH	7.23		0.10	pH units		04-SEP-20	R5214576

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DLQ	Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.
DUPM	MPN duplicate results were outside default ALS Data Quality Objective, but within 95% confidence interval for MPN reference method. Sample results are reliable.
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-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 transferred 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-WT	Water	F2-F4 (O.Reg.153/04)	MOE DECPH-E3421/CCME TIER 1
Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.			
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			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
separated chromatographically, benzo(j)fluoranthene is reported as part of the benzo(b)fluoranthene parameter.			
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 aqueous 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 Substrate 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 ww - 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

Workorder: L2498415

Report Date: 16-SEP-20

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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	R5214576							
WG3399933-5 DUP		L2498415-1						
Alkalinity, Total (as CaCO3)		106	107		mg/L	0.9	20	04-SEP-20
WG3399933-4 LCS								
Alkalinity, Total (as CaCO3)			102.8		%		85-115	04-SEP-20
WG3399933-1 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	04-SEP-20
BOD-CBOD-WP Water								
Batch	R5221796							
WG3398211-4 DUP		L2498415-1						
BOD Carbonaceous		104	107		mg/L	3.0	30	04-SEP-20
WG3398211-2 LCS								
BOD Carbonaceous			97.8		%		85-115	04-SEP-20
WG3398211-1 MB								
BOD Carbonaceous			<2.0		mg/L		2	04-SEP-20
BOD-WP Water								
Batch	R5221796							
WG3398211-2 LCS								
Biochemical Oxygen Demand			99.6		%		85-115	04-SEP-20
WG3398211-1 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	04-SEP-20
BTEXS+F1-HSMS-WP Water								
Batch	R5222012							
WG3400627-13 LCS								
F1 (C6-C10)			109.2		%		70-130	11-SEP-20
WG3400627-2 LCS								
Benzene			99.6		%		70-130	11-SEP-20
Toluene			93.8		%		70-130	11-SEP-20
Ethyl benzene			93.2		%		70-130	11-SEP-20
o-Xylene			96.9		%		70-130	11-SEP-20
m+p-Xylenes			90.7		%		70-130	11-SEP-20
WG3400627-3 LCS								
F1 (C6-C10)			104.0		%		70-130	11-SEP-20
WG3400627-1 MB								
Benzene			<0.00050		mg/L		0.0005	11-SEP-20
Toluene			<0.0010		mg/L		0.001	11-SEP-20
Ethyl benzene			<0.00050		mg/L		0.0005	11-SEP-20
o-Xylene			<0.00050		mg/L		0.0005	11-SEP-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTEXS+F1-HSMS-WP	Water							
Batch	R5222012							
WG3400627-1 MB								
m+p-Xylenes			<0.00040		mg/L		0.0004	11-SEP-20
F1 (C6-C10)			<0.10		mg/L		0.1	11-SEP-20
Surrogate: 4-Bromofluorobenzene (SS)			95.4		%		70-130	11-SEP-20
C-TOC-HTC-WP	Water							
Batch	R5223154							
WG3402614-6 LCS								
Total Organic Carbon			104.0		%		80-120	11-SEP-20
WG3402614-5 MB								
Total Organic Carbon			<0.50		mg/L		0.5	11-SEP-20
CL-IC-N-WP	Water							
Batch	R5219940							
WG3397860-15 DUP		L2498415-1						
Chloride (Cl)		63.4	63.2		mg/L	0.4	20	03-SEP-20
WG3397860-14 LCS								
Chloride (Cl)			96.3		%		90-110	03-SEP-20
WG3397860-13 MB								
Chloride (Cl)			<0.50		mg/L		0.5	03-SEP-20
WG3397860-16 MS		L2498415-1						
Chloride (Cl)			106.7		%		75-125	03-SEP-20
EC-WP	Water							
Batch	R5214576							
WG3399933-5 DUP		L2498415-1						
Conductivity		468	472		umhos/cm	0.9	10	04-SEP-20
WG3399933-3 LCS								
Conductivity			99.3		%		90-110	04-SEP-20
WG3399933-1 MB								
Conductivity			<1.0		umhos/cm		1	04-SEP-20
F-IC-N-WP	Water							
Batch	R5219940							
WG3397860-15 DUP		L2498415-1						
Fluoride (F)		0.176	0.169		mg/L	3.6	20	03-SEP-20
WG3397860-14 LCS								
Fluoride (F)			99.9		%		90-110	03-SEP-20
WG3397860-13 MB								
Fluoride (F)			<0.020		mg/L		0.02	03-SEP-20
WG3397860-16 MS		L2498415-1						



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-WP	Water							
Batch R5219940								
WG3397860-16 MS		L2498415-1						
Fluoride (F)			105.6		%		75-125	03-SEP-20
F2-F4-WT	Water							
Batch R5221477								
WG3399625-2 LCS								
F2 (C10-C16)			96.1		%		65-135	10-SEP-20
F3 (C16-C34)			99.6		%		65-135	10-SEP-20
F4 (C34-C50)			99.2		%		65-135	10-SEP-20
WG3399625-1 MB								
F2 (C10-C16)			<100		ug/L		100	10-SEP-20
F3 (C16-C34)			<250		ug/L		250	10-SEP-20
F4 (C34-C50)			<250		ug/L		250	10-SEP-20
Surrogate: 2-Bromobenzotrifluoride			90.6		%		60-140	10-SEP-20
FC10-QT97-WP	Water							
Batch R5210357								
WG3397714-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	03-SEP-20
HG-T-CVAA-WP	Water							
Batch R5220263								
WG3401604-2 LCS								
Mercury (Hg)-Total			99.0		%		80-120	09-SEP-20
WG3401604-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	09-SEP-20
MET-T-CCMS-WP	Water							
Batch R5217407								
WG3398654-2 LCS								
Aluminum (Al)-Total			91.6		%		80-120	08-SEP-20
Antimony (Sb)-Total			104.9		%		80-120	08-SEP-20
Arsenic (As)-Total			100.6		%		80-120	08-SEP-20
Barium (Ba)-Total			103.1		%		80-120	08-SEP-20
Beryllium (Be)-Total			91.8		%		80-120	08-SEP-20
Bismuth (Bi)-Total			100.6		%		80-120	08-SEP-20
Boron (B)-Total			89.5		%		80-120	08-SEP-20
Cadmium (Cd)-Total			101.2		%		80-120	08-SEP-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R5217407							
WG3398654-2	LCS							
Calcium (Ca)-Total			97.7		%		80-120	08-SEP-20
Cesium (Cs)-Total			104.4		%		80-120	08-SEP-20
Chromium (Cr)-Total			95.3		%		80-120	08-SEP-20
Cobalt (Co)-Total			94.5		%		80-120	08-SEP-20
Copper (Cu)-Total			98.3		%		80-120	08-SEP-20
Iron (Fe)-Total			92.3		%		80-120	08-SEP-20
Lead (Pb)-Total			101.0		%		80-120	08-SEP-20
Lithium (Li)-Total			92.0		%		80-120	08-SEP-20
Magnesium (Mg)-Total			95.8		%		80-120	08-SEP-20
Manganese (Mn)-Total			94.2		%		80-120	08-SEP-20
Molybdenum (Mo)-Total			102.2		%		80-120	08-SEP-20
Nickel (Ni)-Total			95.5		%		80-120	08-SEP-20
Potassium (K)-Total			94.4		%		80-120	08-SEP-20
Phosphorus (P)-Total			92.8		%		80-120	08-SEP-20
Rubidium (Rb)-Total			101.3		%		80-120	08-SEP-20
Selenium (Se)-Total			102.5		%		80-120	08-SEP-20
Silicon (Si)-Total			96.7		%		80-120	08-SEP-20
Silver (Ag)-Total			99.6		%		80-120	08-SEP-20
Sodium (Na)-Total			90.9		%		80-120	08-SEP-20
Strontium (Sr)-Total			101.5		%		80-120	08-SEP-20
Sulfur (S)-Total			92.8		%		80-120	08-SEP-20
Tellurium (Te)-Total			101.2		%		80-120	08-SEP-20
Thallium (Tl)-Total			101.8		%		80-120	08-SEP-20
Thorium (Th)-Total			95.8		%		80-120	08-SEP-20
Tin (Sn)-Total			100.9		%		80-120	08-SEP-20
Titanium (Ti)-Total			88.9		%		80-120	08-SEP-20
Tungsten (W)-Total			100.7		%		80-120	08-SEP-20
Uranium (U)-Total			98.5		%		80-120	08-SEP-20
Vanadium (V)-Total			94.5		%		80-120	08-SEP-20
Zinc (Zn)-Total			99.4		%		80-120	08-SEP-20
Zirconium (Zr)-Total			96.3		%		80-120	08-SEP-20
WG3398654-1	MB							
Aluminum (Al)-Total			<0.0030		mg/L		0.003	08-SEP-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	08-SEP-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R5217407							
WG3398654-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	08-SEP-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	08-SEP-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	08-SEP-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	08-SEP-20
Boron (B)-Total			<0.010		mg/L		0.01	08-SEP-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	08-SEP-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	08-SEP-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	08-SEP-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	08-SEP-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	08-SEP-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	08-SEP-20
Iron (Fe)-Total			<0.010		mg/L		0.01	08-SEP-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	08-SEP-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	08-SEP-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	08-SEP-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	08-SEP-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	08-SEP-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	08-SEP-20
Potassium (K)-Total			<0.050		mg/L		0.05	08-SEP-20
Phosphorus (P)-Total			<0.030		mg/L		0.03	08-SEP-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	08-SEP-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	08-SEP-20
Silicon (Si)-Total			<0.10		mg/L		0.1	08-SEP-20
Silver (Ag)-Total			<0.000010		mg/L		0.00001	08-SEP-20
Sodium (Na)-Total			<0.050		mg/L		0.05	08-SEP-20
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	08-SEP-20
Sulfur (S)-Total			<0.50		mg/L		0.5	08-SEP-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	08-SEP-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	08-SEP-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	08-SEP-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	08-SEP-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	08-SEP-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	08-SEP-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	08-SEP-20



Quality Control Report

Workorder: L2498415

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R5217407							
WG3398654-1 MB								
Vanadium (V)-Total			<0.00050		mg/L		0.0005	08-SEP-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	08-SEP-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	08-SEP-20
NH3-COL-WP	Water							
Batch	R5209846							
WG3397826-22 LCS								
Ammonia, Total (as N)			93.0		%		85-115	03-SEP-20
WG3397826-21 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	03-SEP-20
N02-IC-N-WP	Water							
Batch	R5219940							
WG3397860-15 DUP		L2498415-1						
Nitrite (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	03-SEP-20
WG3397860-14 LCS								
Nitrite (as N)			99.8		%		90-110	03-SEP-20
WG3397860-13 MB								
Nitrite (as N)			<0.010		mg/L		0.01	03-SEP-20
WG3397860-16 MS		L2498415-1						
Nitrite (as N)			107.1		%		75-125	03-SEP-20
N03-IC-N-WP	Water							
Batch	R5219940							
WG3397860-15 DUP		L2498415-1						
Nitrate (as N)		<0.020	<0.020	RPD-NA	mg/L	N/A	20	03-SEP-20
WG3397860-14 LCS								
Nitrate (as N)			96.8		%		90-110	03-SEP-20
WG3397860-13 MB								
Nitrate (as N)			<0.020		mg/L		0.02	03-SEP-20
WG3397860-16 MS		L2498415-1						
Nitrate (as N)			107.7		%		75-125	03-SEP-20
OG-GRAV-WP	Water							
Batch	R5224524							
WG3402396-4 LCS								
Oil and Grease			82.4		%		70-130	16-SEP-20
WG3402396-3 MB								
Oil and Grease			<5.0		mg/L		5	16-SEP-20
P-T-COL-WP	Water							

Quality Control Report

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-WP	Water							
Batch R5217437								
WG3400174-2 LCS								
Phosphorus (P)-Total			92.7		%		80-120	09-SEP-20
WG3400174-1 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	09-SEP-20
PAH-CCME-PPM-WT	Water							
Batch R5222941								
WG3399625-2 LCS								
1-Methyl Naphthalene			102.2		%		50-150	14-SEP-20
2-Methyl Naphthalene			105.0		%		50-150	14-SEP-20
Acenaphthene			119.3		%		50-150	14-SEP-20
Acenaphthylene			110.1		%		50-150	14-SEP-20
Anthracene			110.0		%		50-150	14-SEP-20
Acridine			96.9		%		50-150	14-SEP-20
Benzo(a)anthracene			129.8		%		50-150	14-SEP-20
Benzo(a)pyrene			118.7		%		50-150	14-SEP-20
Benzo(b&j)fluoranthene			112.0		%		50-150	14-SEP-20
Benzo(g,h,i)perylene			118.8		%		50-150	14-SEP-20
Benzo(k)fluoranthene			118.1		%		50-150	14-SEP-20
Chrysene			125.1		%		50-150	14-SEP-20
Dibenzo(a,h)anthracene			122.8		%		50-150	14-SEP-20
Fluoranthene			118.3		%		50-150	14-SEP-20
Fluorene			114.3		%		50-150	14-SEP-20
Indeno(1,2,3-cd)pyrene			128.2		%		50-150	14-SEP-20
Naphthalene			103.9		%		50-150	14-SEP-20
Phenanthrene			119.8		%		50-150	14-SEP-20
Pyrene			120.4		%		50-150	14-SEP-20
Quinoline			118.1		%		50-150	14-SEP-20
WG3399625-1 MB								
1-Methyl Naphthalene			<0.000020		mg/L		0.00002	14-SEP-20
2-Methyl Naphthalene			<0.000020		mg/L		0.00002	14-SEP-20
Acenaphthene			<0.000020		mg/L		0.00002	14-SEP-20
Acenaphthylene			<0.000020		mg/L		0.00002	14-SEP-20
Anthracene			<0.000010		mg/L		0.00001	14-SEP-20
Acridine			<0.000020		mg/L		0.00002	14-SEP-20
Benzo(a)anthracene			<0.000010		mg/L		0.00001	14-SEP-20
Benzo(a)pyrene			<0.0000050		mg/L		0.000005	14-SEP-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-CCME-PPM-WT Water								
Batch R5222941								
WG3399625-1 MB								
Benzo(b&j)fluoranthene			<0.000010		mg/L		0.00001	14-SEP-20
Benzo(g,h,i)perylene			<0.000020		mg/L		0.00002	14-SEP-20
Benzo(k)fluoranthene			<0.000010		mg/L		0.00001	14-SEP-20
Chrysene			<0.000020		mg/L		0.00002	14-SEP-20
Dibenzo(a,h)anthracene			<0.0000050		mg/L		0.000005	14-SEP-20
Fluoranthene			<0.000020		mg/L		0.00002	14-SEP-20
Fluorene			<0.000020		mg/L		0.00002	14-SEP-20
Indeno(1,2,3-cd)pyrene			<0.000010		mg/L		0.00001	14-SEP-20
Naphthalene			<0.000050		mg/L		0.00005	14-SEP-20
Phenanthrene			<0.000050		mg/L		0.00005	14-SEP-20
Pyrene			<0.000010		mg/L		0.00001	14-SEP-20
Quinoline			<0.000020		mg/L		0.00002	14-SEP-20
Surrogate: d8-Naphthalene			93.3		%		50-150	14-SEP-20
Surrogate: d10-Phenanthrene			98.4		%		50-150	14-SEP-20
Surrogate: d12-Chrysene			94.3		%		50-150	14-SEP-20
Surrogate: d10-Acenaphthene			96.4		%		50-150	14-SEP-20
Surrogate: d9-Acridine (SS)			71.6		%		50-150	14-SEP-20
PH-WP Water								
Batch R5214576								
WG3399933-5 DUP								
pH		L2498415-1 7.23	7.22	J	pH units	0.01	0.2	04-SEP-20
WG3399933-2 LCS								
pH			7.35		pH units		7.3-7.5	04-SEP-20
PHENOLS-4AAP-WT Water								
Batch R5222027								
WG3400312-2 LCS								
Phenols (4AAP)			100.9		%		85-115	10-SEP-20
WG3400312-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	10-SEP-20
S04-IC-N-WP Water								
Batch R5219940								
WG3397860-15 DUP								
Sulfate (SO4)		L2498415-1 26.0	25.9		mg/L	0.1	20	03-SEP-20
WG3397860-14 LCS								
Sulfate (SO4)			97.4		%		90-110	03-SEP-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
S04-IC-N-WP	Water							
Batch	R5219940							
WG3397860-13 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	03-SEP-20
WG3397860-16 MS		L2498415-1						
Sulfate (SO4)			106.3		%		75-125	03-SEP-20
SOLIDS-TOTSUS-WP	Water							
Batch	R5214742							
WG3397896-11 LCS								
Total Suspended Solids			108.3		%		85-115	04-SEP-20
WG3397896-10 MB								
Total Suspended Solids			<3.0		mg/L		3	04-SEP-20
TC,EC10-QT97-WP	Water							
Batch	R5210366							
WG3397715-1 MB								
Total Coliforms			<1		MPN/100mL		1	03-SEP-20
Escherichia Coli			<1		MPN/100mL		1	03-SEP-20

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Legend:

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

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

Workorder: L2498415

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH	1	02-SEP-20 10:00	04-SEP-20 12:00	0.25	50	hours	EHTR-FM

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 L2498415 were received on 03-SEP-20 11:25.

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.

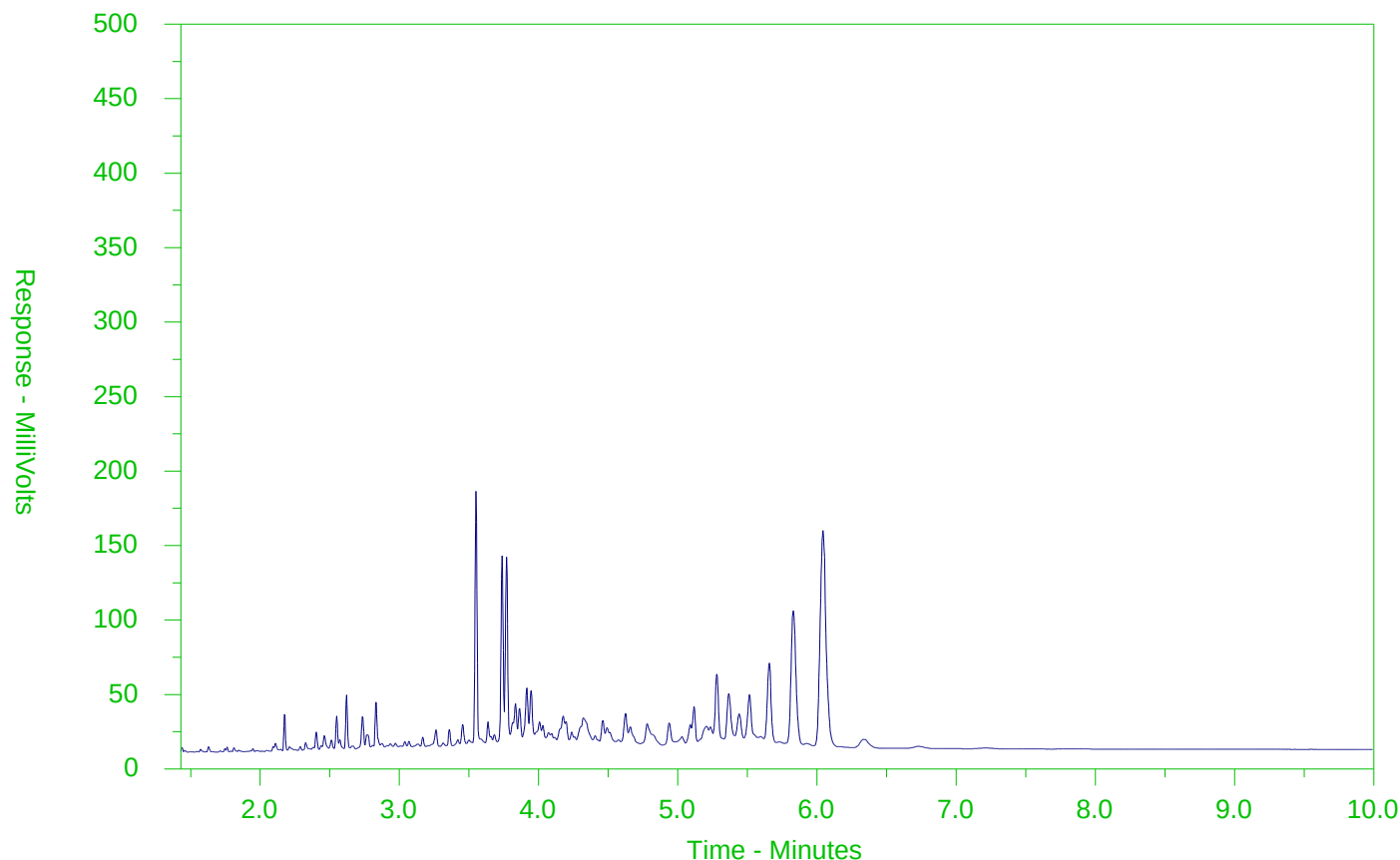
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide 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: L2498415-1
Client Sample ID: RANKIN INLET WWTP - EFFLUENT



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

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 the 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.



12498415-COFC

COC #

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

Date Received: 28-OCT-20
Report Date: 10-NOV-20 11:15 (MT)
Version: FINAL

Client Phone: 867-645-8155

Certificate of Analysis

Lab Work Order #: L2522542

Project P.O. #: NOT SUBMITTED

Job Reference: RANKIN INLET WWTP - MONTHLY EFFLUENT

C of C Numbers:

Legal Site Desc:

Craig Biddell, B.Sc.Ag
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 1329 Niakwa Road East, Unit 12, Winnipeg, MB R2J 3T4 Canada | Phone: +1 204 255 9720 | Fax: +1 204 255 9721
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID				
		L2522542-1 WASTE WATER 26-OCT-20 11:00 RANKIN INLET WWTP - EFFLUENT				
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (umhos/cm)	507				
	Hardness (as CaCO3) (mg/L)	77.1 ^{HTC}				
	pH (pH units)	7.29				
	Total Suspended Solids (mg/L)	96.3				
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	116				
	Ammonia, Total (as N) (mg/L)	13.5				
	Bicarbonate (HCO3) (mg/L)	142				
	Carbonate (CO3) (mg/L)	<0.60				
	Chloride (Cl) (mg/L)	58.0				
	Fluoride (F) (mg/L)	0.156				
	Hydroxide (OH) (mg/L)	<0.34				
	Nitrate and Nitrite as N (mg/L)	<0.070				
	Nitrate (as N) (mg/L)	<0.020				
	Nitrite (as N) (mg/L)	0.016				
	Phosphorus (P)-Total (mg/L)	4.51				
	Sulfate (SO4) (mg/L)	29.7				
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	96.8				
Bacteriological Tests	Escherichia Coli (MPN/100mL)	>24200 ^{PEHR}				
	Fecal Coliforms (MPN/100mL)	>24200 ^{PEHR}				
	Total Coliforms (MPN/100mL)	>24200 ^{PEHR}				
Total Metals	Aluminum (Al)-Total (mg/L)	0.173				
	Antimony (Sb)-Total (mg/L)	0.00037				
	Arsenic (As)-Total (mg/L)	0.00802				
	Barium (Ba)-Total (mg/L)	0.0220				
	Beryllium (Be)-Total (mg/L)	<0.00010				
	Bismuth (Bi)-Total (mg/L)	0.000648				
	Boron (B)-Total (mg/L)	0.070				
	Cadmium (Cd)-Total (mg/L)	0.0000991				
	Calcium (Ca)-Total (mg/L)	21.2				
	Cesium (Cs)-Total (mg/L)	0.000100				
	Chromium (Cr)-Total (mg/L)	0.00129				
	Cobalt (Co)-Total (mg/L)	0.00032				
	Copper (Cu)-Total (mg/L)	0.192				
	Iron (Fe)-Total (mg/L)	1.14				
	Lead (Pb)-Total (mg/L)	0.00237				
	Lithium (Li)-Total (mg/L)	0.0028				

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID				
		L2522542-1 WASTE WATER 26-OCT-20 11:00 RANKIN INLET WWTP - EFFLUENT				
Grouping	Analyte					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	5.85				
	Manganese (Mn)-Total (mg/L)	0.0303				
	Mercury (Hg)-Total (mg/L)	0.0000183				
	Molybdenum (Mo)-Total (mg/L)	0.00135				
	Nickel (Ni)-Total (mg/L)	0.00663				
	Phosphorus (P)-Total (mg/L)	4.71				
	Potassium (K)-Total (mg/L)	10.2				
	Rubidium (Rb)-Total (mg/L)	0.00960				
	Selenium (Se)-Total (mg/L)	0.000297				
	Silicon (Si)-Total (mg/L)	0.53				
	Silver (Ag)-Total (mg/L)	0.000050				
	Sodium (Na)-Total (mg/L)	36.3				
	Strontium (Sr)-Total (mg/L)	0.103				
	Sulfur (S)-Total (mg/L)	11.7				
	Tellurium (Te)-Total (mg/L)	<0.00020				
	Thallium (Tl)-Total (mg/L)	0.000010				
	Thorium (Th)-Total (mg/L)	<0.00010				
	Tin (Sn)-Total (mg/L)	0.00079				
	Titanium (Ti)-Total (mg/L)	0.00322				
	Tungsten (W)-Total (mg/L)	<0.00010				
	Uranium (U)-Total (mg/L)	0.000231				
	Vanadium (V)-Total (mg/L)	0.00131				
	Zinc (Zn)-Total (mg/L)	0.146				
	Zirconium (Zr)-Total (mg/L)	0.00070				
Aggregate Organics	Biochemical Oxygen Demand (mg/L)	159				
	BOD Carbonaceous (mg/L)	141				
	Oil and Grease (mg/L)	24.1				
	Phenols (4AAP) (mg/L)	0.0083				
Volatile Organic Compounds	Benzene (mg/L)	<0.00050				
	Ethyl benzene (mg/L)	<0.00050				
	Toluene (mg/L)	<0.0010				
	o-Xylene (mg/L)	<0.00050				
	m+p-Xylenes (mg/L)	<0.00040				
	Xylenes (Total) (mg/L)	<0.00064				
	F1 (C6-C10) (mg/L)	<0.10				
	Surrogate: 4-Bromofluorobenzene (SS) (%)	96.4				

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L2522542-1 WASTE WATER 26-OCT-20 11:00 RANKIN INLET WWTP - EFFLUENT				
Grouping	Analyte					
WATER						
Volatile Organic Compounds	Surrogate: 3,4-Dichlorotoluene (SS) (%)	117.6				
Hydrocarbons	F2 (C10-C16) (mg/L)	<0.10				
	F3 (C16-C34) (mg/L)	1.09				
	F4 (C34-C50) (mg/L)	0.57				
	Chrom. to baseline at nC50	YES				
	Surrogate: 2-Bromobenzotrifluoride (%)	91.5				
Polycyclic Aromatic Hydrocarbons	Acenaphthene (mg/L)	<0.000020				
	Acenaphthylene (mg/L)	<0.000020				
	Acridine (mg/L)	<0.000020				
	Anthracene (mg/L)	<0.000010				
	Benzo(a)anthracene (mg/L)	<0.000010				
	Benzo(a)pyrene (mg/L)	<0.0000050				
	Benzo(b&j)fluoranthene (mg/L)	<0.000010				
	Benzo(g,h,i)perylene (mg/L)	0.000022				
	Benzo(k)fluoranthene (mg/L)	<0.000010				
	Chrysene (mg/L)	<0.000020				
	Dibenzo(a,h)anthracene (mg/L)	0.0000108				
	Fluoranthene (mg/L)	<0.000020				
	Fluorene (mg/L)	<0.000020				
	Indeno(1,2,3-cd)pyrene (mg/L)	0.000158				
	1-Methyl Naphthalene (mg/L)	<0.000020				
	2-Methyl Naphthalene (mg/L)	<0.000020				
	Naphthalene (mg/L)	<0.000050				
	Phenanthrene (mg/L)	<0.000050				
	Pyrene (mg/L)	<0.000010				
	Quinoline (mg/L)	<0.000120 ^{DLQ}				
	Surrogate: d10-Acenaphthene (%)	84.7				
	Surrogate: d9-Acridine (SS) (%)	94.1				
	Surrogate: d12-Chrysene (%)	77.3				
	Surrogate: d8-Naphthalene (%)	152.3 ^{SOL:M}				
	Surrogate: d10-Phenanthrene (%)	82.9				
	B(a)P Total Potency Equivalent (mg/L)	0.000031				

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

Reference Information

Additional Comments for Sample Listed:

Samplenum	Matrix	Report Remarks	Sample Comment:
L2522542-1	Water	Note: Unknown container. Sample received in a container not provided by ALS. Container appears to be appropriate	
L2522542-1	Water	Note: Unknown sample container. Sample received in a container not provided by ALS. Container type appears to be appropriate	

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Conductivity	B	L2522542-1
Method Blank	Arsenic (As)-Total	B	L2522542-1
Method Blank	Nickel (Ni)-Total	B	L2522542-1
Method Blank	Vanadium (V)-Total	B	L2522542-1
Matrix Spike	Total Organic Carbon	MS-B	L2522542-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2522542-1
Matrix Spike	Boron (B)-Total	MS-B	L2522542-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2522542-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2522542-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2522542-1
Matrix Spike	Potassium (K)-Total	MS-B	L2522542-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2522542-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2522542-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2522542-1

Qualifiers for Individual Parameters Listed:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
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.
SOL:MI	Surrogate recovery outside acceptable limits due to matrix interference

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

Reference Information

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 transferred 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.

F2-F4-PPM-WT Water F2-F4 reported in ppm MOE DECPH-E3421/CCME TIER 1

Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil, Tier 1 Method, CCME, 2001.

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)

Reference Information

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

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 aqueous 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 Substrate 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
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

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

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

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

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

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

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

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

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

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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	R5272787							
WG3436899-10 DUP		L2522542-1						
Alkalinity, Total (as CaCO3)		116	117		mg/L	0.3	20	30-OCT-20
WG3436899-9 LCS								
Alkalinity, Total (as CaCO3)			97.5		%		85-115	30-OCT-20
WG3436899-6 MB								
Alkalinity, Total (as CaCO3)			1.0		mg/L		1	30-OCT-20
BOD-CBOD-WP Water								
Batch	R5274668							
WG3433266-12 LCS								
BOD Carbonaceous			101.1		%		85-115	28-OCT-20
WG3433266-11 MB								
BOD Carbonaceous			<2.0		mg/L		2	28-OCT-20
BOD-WP Water								
Batch	R5274668							
WG3433266-12 LCS								
Biochemical Oxygen Demand			100.1		%		85-115	28-OCT-20
WG3433266-11 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	28-OCT-20
BTEXS+F1-HSMS-WP Water								
Batch	R5271739							
WG3435220-2 LCS								
Benzene			103.1		%		70-130	29-OCT-20
Toluene			88.8		%		70-130	29-OCT-20
Ethyl benzene			89.4		%		70-130	29-OCT-20
o-Xylene			101.4		%		70-130	29-OCT-20
m+p-Xylenes			101.3		%		70-130	29-OCT-20
WG3435220-3 LCS								
F1 (C6-C10)			86.8		%		70-130	29-OCT-20
WG3435220-1 MB								
Benzene			<0.00050		mg/L		0.0005	29-OCT-20
Toluene			<0.0010		mg/L		0.001	29-OCT-20
Ethyl benzene			<0.00050		mg/L		0.0005	29-OCT-20
o-Xylene			<0.00050		mg/L		0.0005	29-OCT-20
m+p-Xylenes			<0.00040		mg/L		0.0004	29-OCT-20
F1 (C6-C10)			<0.10		mg/L		0.1	29-OCT-20
Surrogate: 4-Bromofluorobenzene (SS)			89.2		%		70-130	29-OCT-20
Surrogate: 3,4-Dichlorotoluene (SS)			115.0		%		70-130	29-OCT-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-TOC-HTC-WP	Water							
Batch	R5283327							
WG3442574-2	LCS							
Total Organic Carbon			98.6		%		80-120	09-NOV-20
WG3442574-1	MB							
Total Organic Carbon			<0.50		mg/L		0.5	09-NOV-20
CL-IC-N-WP	Water							
Batch	R5272220							
WG3434293-10	LCS							
Chloride (Cl)			99.6		%		90-110	29-OCT-20
WG3434293-9	MB							
Chloride (Cl)			<0.50		mg/L		0.5	29-OCT-20
E-C-WP	Water							
Batch	R5272787							
WG3436899-10	DUP	L2522542-1						
Conductivity		507	509		umhos/cm	0.4	10	30-OCT-20
WG3436899-8	LCS							
Conductivity			103.5		%		90-110	30-OCT-20
WG3436899-6	MB							
Conductivity			1.3	B	umhos/cm		1	30-OCT-20
F-IC-N-WP	Water							
Batch	R5272220							
WG3434293-10	LCS							
Fluoride (F)			103.1		%		90-110	29-OCT-20
WG3434293-9	MB							
Fluoride (F)			<0.020		mg/L		0.02	29-OCT-20
F2-F4-PPM-WT	Water							
Batch	R5272697							
WG3435472-2	LCS							
F2 (C10-C16)			99.3		%		65-135	02-NOV-20
F3 (C16-C34)			112.4		%		65-135	02-NOV-20
F4 (C34-C50)			97.0		%		65-135	02-NOV-20
WG3435472-1	MB							
F2 (C10-C16)			<0.10		mg/L		0.1	02-NOV-20
F3 (C16-C34)			<0.25		mg/L		0.25	02-NOV-20
F4 (C34-C50)			<0.25		mg/L		0.25	02-NOV-20
Surrogate: 2-Bromobenzotrifluoride			83.8		%		60-140	02-NOV-20
FC10-QT97-WP	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
FC10-QT97-WP	Water							
Batch	R5270918							
WG3434123-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	28-OCT-20
HG-T-CVAA-WP	Water							
Batch	R5280436							
WG3439609-2 LCS								
Mercury (Hg)-Total			89.4		%		80-120	04-NOV-20
WG3439609-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	04-NOV-20
MET-T-CCMS-WP	Water							
Batch	R5272734							
WG3435877-2 LCS								
Aluminum (Al)-Total			99.8		%		80-120	30-OCT-20
Antimony (Sb)-Total			99.4		%		80-120	30-OCT-20
Arsenic (As)-Total			97.8		%		80-120	30-OCT-20
Barium (Ba)-Total			97.7		%		80-120	30-OCT-20
Beryllium (Be)-Total			97.4		%		80-120	30-OCT-20
Bismuth (Bi)-Total			96.7		%		80-120	30-OCT-20
Boron (B)-Total			94.4		%		80-120	30-OCT-20
Cadmium (Cd)-Total			98.7		%		80-120	30-OCT-20
Calcium (Ca)-Total			95.9		%		80-120	30-OCT-20
Cesium (Cs)-Total			99.0		%		80-120	30-OCT-20
Chromium (Cr)-Total			96.9		%		80-120	30-OCT-20
Cobalt (Co)-Total			96.8		%		80-120	30-OCT-20
Copper (Cu)-Total			98.5		%		80-120	30-OCT-20
Iron (Fe)-Total			98.5		%		80-120	30-OCT-20
Lead (Pb)-Total			96.3		%		80-120	30-OCT-20
Lithium (Li)-Total			97.8		%		80-120	30-OCT-20
Magnesium (Mg)-Total			103.0		%		80-120	30-OCT-20
Manganese (Mn)-Total			99.3		%		80-120	30-OCT-20
Molybdenum (Mo)-Total			97.1		%		80-120	30-OCT-20
Nickel (Ni)-Total			97.5		%		80-120	30-OCT-20
Potassium (K)-Total			99.0		%		80-120	30-OCT-20
Phosphorus (P)-Total			104.6		%		80-120	30-OCT-20
Rubidium (Rb)-Total			97.3		%		80-120	30-OCT-20
Selenium (Se)-Total			98.4		%		80-120	30-OCT-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R5272734							
WG3435877-2 LCS								
Silicon (Si)-Total			98.8		%		80-120	30-OCT-20
Silver (Ag)-Total			97.4		%		80-120	30-OCT-20
Sodium (Na)-Total			101.0		%		80-120	30-OCT-20
Strontium (Sr)-Total			96.3		%		80-120	30-OCT-20
Sulfur (S)-Total			93.7		%		80-120	30-OCT-20
Tellurium (Te)-Total			96.1		%		80-120	30-OCT-20
Thallium (Tl)-Total			96.1		%		80-120	30-OCT-20
Thorium (Th)-Total			89.1		%		80-120	30-OCT-20
Tin (Sn)-Total			96.6		%		80-120	30-OCT-20
Titanium (Ti)-Total			95.6		%		80-120	30-OCT-20
Tungsten (W)-Total			95.2		%		80-120	30-OCT-20
Uranium (U)-Total			91.3		%		80-120	30-OCT-20
Vanadium (V)-Total			100.4		%		80-120	30-OCT-20
Zinc (Zn)-Total			100.2		%		80-120	30-OCT-20
Zirconium (Zr)-Total			90.7		%		80-120	30-OCT-20
WG3435877-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	30-OCT-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Arsenic (As)-Total			0.00041	B	mg/L		0.0001	30-OCT-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	30-OCT-20
Boron (B)-Total			<0.010		mg/L		0.01	30-OCT-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	30-OCT-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	30-OCT-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	30-OCT-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	30-OCT-20
Iron (Fe)-Total			<0.010		mg/L		0.01	30-OCT-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	30-OCT-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	30-OCT-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	30-OCT-20
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	30-OCT-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R5272734							
WG3435877-1 MB								
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	30-OCT-20
Nickel (Ni)-Total			0.00376	B	mg/L		0.0005	30-OCT-20
Potassium (K)-Total			<0.050		mg/L		0.05	30-OCT-20
Phosphorus (P)-Total			<0.030		mg/L		0.03	30-OCT-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	30-OCT-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	30-OCT-20
Silicon (Si)-Total			<0.10		mg/L		0.1	30-OCT-20
Silver (Ag)-Total			<0.000010		mg/L		0.00001	30-OCT-20
Sodium (Na)-Total			<0.050		mg/L		0.05	30-OCT-20
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	30-OCT-20
Sulfur (S)-Total			<0.50		mg/L		0.5	30-OCT-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	30-OCT-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	30-OCT-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	30-OCT-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	30-OCT-20
Vanadium (V)-Total			0.00106	B	mg/L		0.0005	30-OCT-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	30-OCT-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	30-OCT-20
NH3-COL-WP	Water							
Batch	R5270965							
WG3434371-18 LCS								
Ammonia, Total (as N)			100.8		%		85-115	28-OCT-20
WG3434371-17 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	28-OCT-20
N02-IC-N-WP	Water							
Batch	R5272220							
WG3434293-10 LCS								
Nitrite (as N)			99.5		%		90-110	29-OCT-20
WG3434293-9 MB								
Nitrite (as N)			<0.010		mg/L		0.01	29-OCT-20
N03-IC-N-WP	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
N03-IC-N-WP	Water							
Batch	R5272220							
WG3434293-10	LCS							
Nitrate (as N)			100.7		%		90-110	29-OCT-20
WG3434293-9	MB							
Nitrate (as N)			<0.020		mg/L		0.02	29-OCT-20
OG-GRAV-WP	Water							
Batch	R5278456							
WG3438392-2	LCS							
Oil and Grease			96.0		%		70-130	03-NOV-20
WG3438392-1	MB							
Oil and Grease			<5.0		mg/L		5	03-NOV-20
P-T-COL-WP	Water							
Batch	R5271845							
WG3435268-10	LCS							
Phosphorus (P)-Total			92.1		%		80-120	30-OCT-20
WG3435268-9	MB							
Phosphorus (P)-Total			<0.0030		mg/L		0.003	30-OCT-20
PAH-CCME-PPM-WT	Water							
Batch	R5281010							
WG3435472-2	LCS							
1-Methyl Naphthalene			104.6		%		50-150	05-NOV-20
2-Methyl Naphthalene			98.2		%		50-150	05-NOV-20
Acenaphthene			104.9		%		50-150	05-NOV-20
Acenaphthylene			104.3		%		50-150	05-NOV-20
Anthracene			110.6		%		50-150	05-NOV-20
Acridine			111.5		%		50-150	05-NOV-20
Benzo(a)anthracene			126.3		%		50-150	05-NOV-20
Benzo(a)pyrene			93.7		%		50-150	05-NOV-20
Benzo(b&j)fluoranthene			112.9		%		50-150	05-NOV-20
Benzo(g,h,i)perylene			105.5		%		50-150	05-NOV-20
Benzo(k)fluoranthene			99.6		%		50-150	05-NOV-20
Chrysene			101.4		%		50-150	05-NOV-20
Dibenzo(a,h)anthracene			116.6		%		50-150	05-NOV-20
Fluoranthene			105.8		%		50-150	05-NOV-20
Fluorene			109.5		%		50-150	05-NOV-20
Indeno(1,2,3-cd)pyrene			136.4		%		50-150	05-NOV-20
Naphthalene			99.9		%		50-150	05-NOV-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-CCME-PPM-WT		Water						
Batch R5281010								
WG3435472-2 LCS								
Phenanthrene			116.0		%		50-150	05-NOV-20
Pyrene			115.2		%		50-150	05-NOV-20
Quinoline			115.9		%		50-150	05-NOV-20
WG3435472-1 MB								
1-Methyl Naphthalene			<0.000020		mg/L		0.00002	05-NOV-20
2-Methyl Naphthalene			<0.000020		mg/L		0.00002	05-NOV-20
Acenaphthene			<0.000020		mg/L		0.00002	05-NOV-20
Acenaphthylene			<0.000020		mg/L		0.00002	05-NOV-20
Anthracene			<0.000010		mg/L		0.00001	05-NOV-20
Acridine			<0.000020		mg/L		0.00002	05-NOV-20
Benzo(a)anthracene			<0.000010		mg/L		0.00001	05-NOV-20
Benzo(a)pyrene			<0.000005C		mg/L		0.000005	05-NOV-20
Benzo(b&j)fluoranthene			<0.000010		mg/L		0.00001	05-NOV-20
Benzo(g,h,i)perylene			<0.000020		mg/L		0.00002	05-NOV-20
Benzo(k)fluoranthene			<0.000010		mg/L		0.00001	05-NOV-20
Chrysene			<0.000020		mg/L		0.00002	05-NOV-20
Dibenzo(a,h)anthracene			<0.000005C		mg/L		0.000005	05-NOV-20
Fluoranthene			<0.000020		mg/L		0.00002	05-NOV-20
Fluorene			<0.000020		mg/L		0.00002	05-NOV-20
Indeno(1,2,3-cd)pyrene			<0.000010		mg/L		0.00001	05-NOV-20
Naphthalene			<0.000050		mg/L		0.00005	05-NOV-20
Phenanthrene			<0.000050		mg/L		0.00005	05-NOV-20
Pyrene			<0.000010		mg/L		0.00001	05-NOV-20
Quinoline			<0.000020		mg/L		0.00002	05-NOV-20
Surrogate: d8-Naphthalene			88.5		%		50-150	05-NOV-20
Surrogate: d10-Phenanthrene			92.9		%		50-150	05-NOV-20
Surrogate: d12-Chrysene			91.3		%		50-150	05-NOV-20
Surrogate: d10-Acenaphthene			89.6		%		50-150	05-NOV-20
Surrogate: d9-Acridine (SS)			81.9		%		50-150	05-NOV-20
PH-WP		Water						
Batch R5272787								
WG3436899-10 DUP		L2522542-1						
pH		7.29	7.28	J	pH units	0.01	0.2	30-OCT-20
WG3436899-7 LCS								
pH			7.35		pH units		7.3-7.5	30-OCT-20



Quality Control Report

Workorder: L2522542

Report Date: 10-NOV-20

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PHENOLS-4AAP-WT	Water							
Batch	R5274196							
WG3436199-2	LCS							
Phenols (4AAP)			93.4		%		85-115	02-NOV-20
WG3436199-1	MB							
Phenols (4AAP)			<0.0010		mg/L		0.001	02-NOV-20
S04-IC-N-WP	Water							
Batch	R5272220							
WG3434293-10	LCS							
Sulfate (SO4)			101.4		%		90-110	29-OCT-20
WG3434293-9	MB							
Sulfate (SO4)			<0.30		mg/L		0.3	29-OCT-20
SOLIDS-TOTSUS-WP	Water							
Batch	R5271840							
WG3434795-9	LCS							
Total Suspended Solids			94.8		%		85-115	29-OCT-20
WG3434795-8	MB							
Total Suspended Solids			<3.0		mg/L		3	29-OCT-20
TC,EC10-QT97-WP	Water							
Batch	R5270901							
WG3434137-1	MB							
Total Coliforms			<1		MPN/100mL		1	28-OCT-20
Escherichia Coli			<1		MPN/100mL		1	28-OCT-20

Quality Control Report

Workorder: L2522542

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Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
J	Duplicate results and limits are expressed in terms of absolute difference.

Quality Control Report

Workorder: L2522542

Report Date: 10-NOV-20

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH	1	26-OCT-20 11:00	30-OCT-20 12:00	0.25	97	hours	EHTR-FM
Bacteriological Tests							
Fecal coliforms, 1:10 dilution by QT97	1	26-OCT-20 11:00	28-OCT-20 14:35	30	52	hours	EHTR
Total and E. coli, 1:10 dilution by QT97	1	26-OCT-20 11:00	28-OCT-20 14:35	30	52	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 L2522542 were received on 28-OCT-20 12:05.

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.

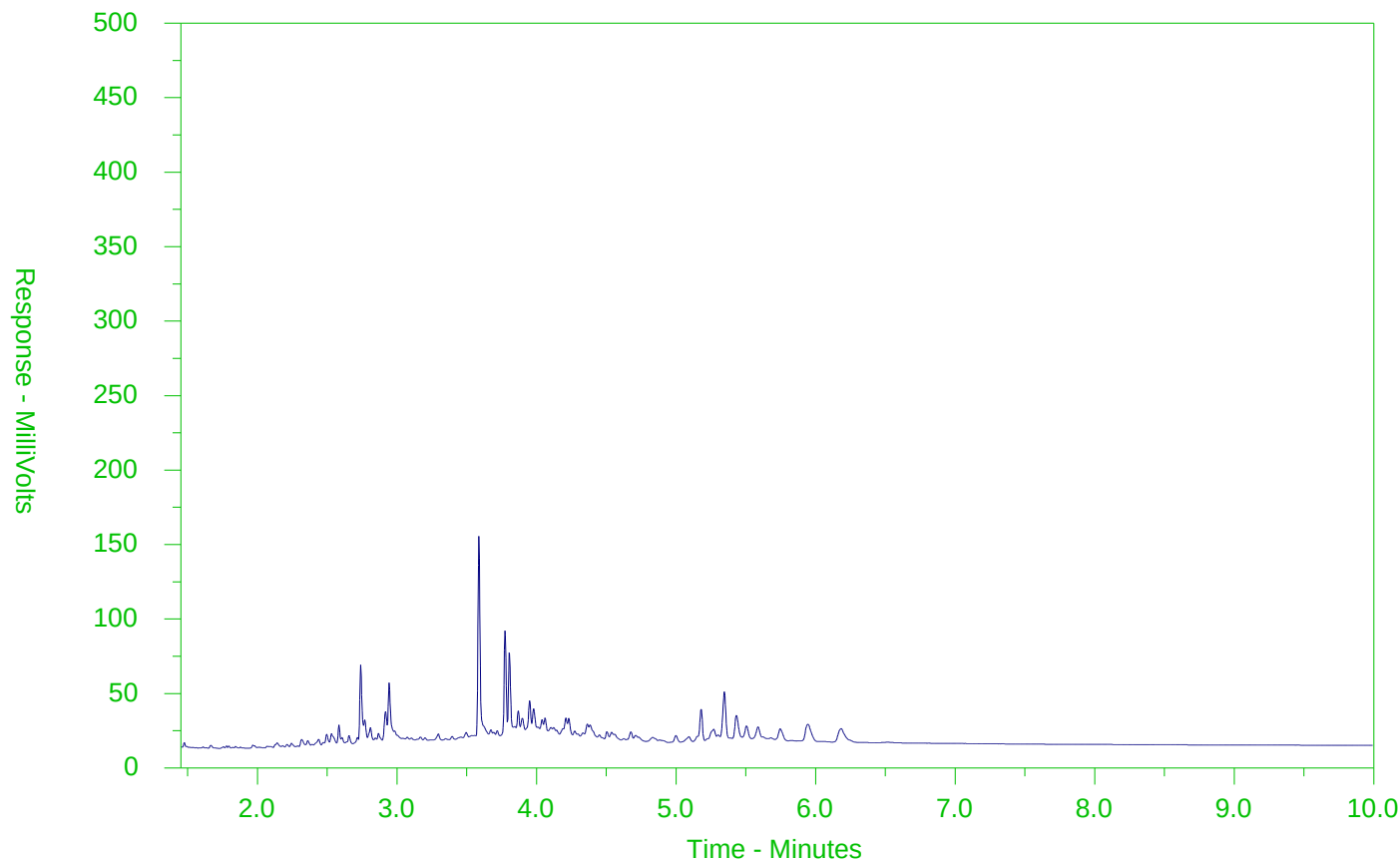
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide 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: L2522542-1
Client Sample ID: RANKIN INLET WWTP - EFFLUENT



F2		F3		F4	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

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 the 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.



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L2522542-COFC

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: 11-DEC-20
Report Date: 22-DEC-20 14:22 (MT)
Version: FINAL

Client Phone: 867-645-8155

Certificate of Analysis

Lab Work Order #: L2539433

Project P.O. #: NOT SUBMITTED

Job Reference: RANKIN INLET WWTP - MONTHLY EFFLUENT

C of C Numbers:

Legal Site Desc:

Craig Biddell, B.Sc.Ag
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2539433-1 RANKIN INLET WWTP - EFFLUENT							
Sampled By: SD on 07-DEC-20 @ 10:30							
Matrix: WASTE							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		16-DEC-20	R5319085
Toluene	<0.0010		0.0010	mg/L		16-DEC-20	R5319085
Ethyl benzene	<0.00050		0.00050	mg/L		16-DEC-20	R5319085
o-Xylene	<0.00050		0.00050	mg/L		16-DEC-20	R5319085
m+p-Xylenes	<0.00040		0.00040	mg/L		16-DEC-20	R5319085
F1 (C6-C10)	<0.10		0.10	mg/L		16-DEC-20	R5319085
Surrogate: 4-Bromofluorobenzene (SS)	79.0		70-130	%		16-DEC-20	R5319085
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	19-DEC-20	19-DEC-20	R5320543
F3 (C16-C34)	0.33		0.25	mg/L	19-DEC-20	19-DEC-20	R5320543
F4 (C34-C50)	<0.25		0.25	mg/L	19-DEC-20	19-DEC-20	R5320543
Surrogate: 2-Bromobenzotrifluoride	106.7		60-140	%	19-DEC-20	19-DEC-20	R5320543
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		22-DEC-20	
F2-Naphth	<0.10		0.10	mg/L		22-DEC-20	
F3-PAH	0.33		0.25	mg/L		22-DEC-20	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		22-DEC-20	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		21-DEC-20	
Miscellaneous Parameters							
Fluoride (F)	0.074		0.020	mg/L		11-DEC-20	R5316642
Total and E. coli, 1:10 dilution by QT97							
Total Coliforms	>24200		10	MPN/100mL		11-DEC-20	R5312969
Escherichia Coli	3280		10	MPN/100mL		11-DEC-20	R5312969
CCME PAHs in mg/L							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	18-DEC-20	22-DEC-20	R5320919
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	18-DEC-20	22-DEC-20	R5320919
Acenaphthene	<0.000020		0.000020	mg/L	18-DEC-20	22-DEC-20	R5320919
Acenaphthylene	<0.000020		0.000020	mg/L	18-DEC-20	22-DEC-20	R5320919
Anthracene	<0.000010		0.000010	mg/L	18-DEC-20	22-DEC-20	R5320919
Acridine	<0.000020		0.000020	mg/L	18-DEC-20	22-DEC-20	R5320919
Benzo(a)anthracene	<0.000010		0.000010	mg/L	18-DEC-20	22-DEC-20	R5320919
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	18-DEC-20	22-DEC-20	R5320919
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	18-DEC-20	22-DEC-20	R5320919
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	18-DEC-20	22-DEC-20	R5320919
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	18-DEC-20	22-DEC-20	R5320919
Chrysene	<0.000020		0.000020	mg/L	18-DEC-20	22-DEC-20	R5320919
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	18-DEC-20	22-DEC-20	R5320919
Fluoranthene	<0.000020		0.000020	mg/L	18-DEC-20	22-DEC-20	R5320919
Fluorene	<0.000020		0.000020	mg/L	18-DEC-20	22-DEC-20	R5320919
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	18-DEC-20	22-DEC-20	R5320919
Naphthalene	<0.000050		0.000050	mg/L	18-DEC-20	22-DEC-20	R5320919
Phenanthrene	<0.000050		0.000050	mg/L	18-DEC-20	22-DEC-20	R5320919
Pyrene	<0.000010		0.000010	mg/L	18-DEC-20	22-DEC-20	R5320919
Quinoline	<0.000020		0.000020	mg/L	18-DEC-20	22-DEC-20	R5320919
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	18-DEC-20	22-DEC-20	R5320919
Surrogate: d8-Naphthalene	93.0		50-150	%	18-DEC-20	22-DEC-20	R5320919
Surrogate: d10-Phenanthrene	93.2		50-150	%	18-DEC-20	22-DEC-20	R5320919
Surrogate: d12-Chrysene	84.3		50-150	%	18-DEC-20	22-DEC-20	R5320919
Surrogate: d10-Acenaphthene	92.0		50-150	%	18-DEC-20	22-DEC-20	R5320919
Surrogate: d9-Acridine (SS)	82.2		50-150	%	18-DEC-20	22-DEC-20	R5320919

* 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
L2539433-1 RANKIN INLET WWTP - EFFLUENT Sampled By: SD on 07-DEC-20 @ 10:30 Matrix: WASTE Nunavut WW Group 1							
Alkalinity, Bicarbonate Bicarbonate (HCO3)	52.7		1.2	mg/L		15-DEC-20	
Alkalinity, Carbonate Carbonate (CO3)	<0.60		0.60	mg/L		15-DEC-20	
Alkalinity, Hydroxide Hydroxide (OH)	<0.34		0.34	mg/L		15-DEC-20	
Alkalinity, Total (as CaCO3) Alkalinity, Total (as CaCO3)	43.2		1.0	mg/L		14-DEC-20	R5316576
Ammonia by colour Ammonia, Total (as N)	0.418		0.010	mg/L		11-DEC-20	R5313279
Biochemical Oxygen Demand (BOD) Biochemical Oxygen Demand	6.3		2.0	mg/L		11-DEC-20	R5318504
Carbonaceous BOD BOD Carbonaceous	5.4		2.0	mg/L		11-DEC-20	R5318504
Chloride in Water by IC Chloride (Cl)	41.4		0.50	mg/L		11-DEC-20	R5316642
Conductivity Conductivity	276		1.0	umhos/cm		14-DEC-20	R5316576
Fecal coliforms, 1:10 dilution by QT97 Fecal Coliforms	2910		10	MPN/100mL		11-DEC-20	R5312966
Hardness Calculated Hardness (as CaCO3)	83.1	HTC	0.20	mg/L		17-DEC-20	
Mercury Total Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	15-DEC-20	15-DEC-20	R5317622
Nitrate in Water by IC Nitrate (as N)	<0.020		0.020	mg/L		11-DEC-20	R5316642
Nitrate+Nitrite Nitrate and Nitrite as N	<0.070		0.070	mg/L		15-DEC-20	
Nitrite in Water by IC Nitrite (as N)	<0.010		0.010	mg/L		11-DEC-20	R5316642
Oil & Grease - Gravimetric Oil and Grease	<5.0		5.0	mg/L		18-DEC-20	R5320022
Phenol (4AAP) Phenols (4AAP)	0.0011		0.0010	mg/L		18-DEC-20	R5320090
Phosphorus, Total Phosphorus (P)-Total	0.127		0.0030	mg/L		17-DEC-20	R5318657
Sulfate in Water by IC Sulfate (SO4)	22.2		0.30	mg/L		11-DEC-20	R5316642
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0453		0.0030	mg/L	16-DEC-20	16-DEC-20	R5318591
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	16-DEC-20	16-DEC-20	R5318591
Arsenic (As)-Total	0.00085		0.00010	mg/L	16-DEC-20	16-DEC-20	R5318591
Barium (Ba)-Total	0.0240		0.00010	mg/L	16-DEC-20	16-DEC-20	R5318591
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	16-DEC-20	16-DEC-20	R5318591
Bismuth (Bi)-Total	0.000086		0.000050	mg/L	16-DEC-20	16-DEC-20	R5318591
Boron (B)-Total	0.041		0.010	mg/L	16-DEC-20	16-DEC-20	R5318591
Cadmium (Cd)-Total	0.0000106		0.0000050	mg/L	16-DEC-20	16-DEC-20	R5318591
Calcium (Ca)-Total	24.1		0.050	mg/L	16-DEC-20	16-DEC-20	R5318591
Cesium (Cs)-Total	0.000023		0.000010	mg/L	16-DEC-20	16-DEC-20	R5318591
Chromium (Cr)-Total	0.00269		0.00010	mg/L	16-DEC-20	16-DEC-20	R5318591
Cobalt (Co)-Total	0.00013		0.00010	mg/L	16-DEC-20	16-DEC-20	R5318591
Copper (Cu)-Total	0.0350		0.00050	mg/L	16-DEC-20	16-DEC-20	R5318591

* 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
L2539433-1 RANKIN INLET WWTP - EFFLUENT								
Sampled By: SD on 07-DEC-20 @ 10:30								
Matrix: WASTE								
Total Metals in Water by CRC ICPMS								
Iron (Fe)-Total		0.608		0.010	mg/L	16-DEC-20	16-DEC-20	R5318591
Lead (Pb)-Total		0.000387		0.000050	mg/L	16-DEC-20	16-DEC-20	R5318591
Lithium (Li)-Total		0.0034		0.0010	mg/L	16-DEC-20	16-DEC-20	R5318591
Magnesium (Mg)-Total		5.59		0.0050	mg/L	16-DEC-20	16-DEC-20	R5318591
Manganese (Mn)-Total		0.0182		0.00010	mg/L	16-DEC-20	16-DEC-20	R5318591
Molybdenum (Mo)-Total		0.000894		0.000050	mg/L	16-DEC-20	16-DEC-20	R5318591
Nickel (Ni)-Total		0.00313		0.00050	mg/L	16-DEC-20	16-DEC-20	R5318591
Potassium (K)-Total		3.16		0.050	mg/L	16-DEC-20	16-DEC-20	R5318591
Phosphorus (P)-Total		0.125		0.030	mg/L	16-DEC-20	16-DEC-20	R5318591
Rubidium (Rb)-Total		0.00274		0.00020	mg/L	16-DEC-20	16-DEC-20	R5318591
Selenium (Se)-Total		0.000072		0.000050	mg/L	16-DEC-20	16-DEC-20	R5318591
Silicon (Si)-Total		0.11		0.10	mg/L	16-DEC-20	16-DEC-20	R5318591
Silver (Ag)-Total		<0.000010		0.000010	mg/L	16-DEC-20	16-DEC-20	R5318591
Sodium (Na)-Total		25.3		0.050	mg/L	16-DEC-20	16-DEC-20	R5318591
Strontium (Sr)-Total		0.106		0.00020	mg/L	16-DEC-20	16-DEC-20	R5318591
Sulfur (S)-Total		8.55		0.50	mg/L	16-DEC-20	16-DEC-20	R5318591
Tellurium (Te)-Total		<0.00020		0.00020	mg/L	16-DEC-20	16-DEC-20	R5318591
Thallium (Tl)-Total		<0.000010		0.000010	mg/L	16-DEC-20	16-DEC-20	R5318591
Thorium (Th)-Total		<0.00010		0.00010	mg/L	16-DEC-20	16-DEC-20	R5318591
Tin (Sn)-Total		0.00011		0.00010	mg/L	16-DEC-20	16-DEC-20	R5318591
Titanium (Ti)-Total		0.00085		0.00030	mg/L	16-DEC-20	16-DEC-20	R5318591
Tungsten (W)-Total		<0.00010		0.00010	mg/L	16-DEC-20	16-DEC-20	R5318591
Uranium (U)-Total		0.000122		0.000010	mg/L	16-DEC-20	16-DEC-20	R5318591
Vanadium (V)-Total		0.00062		0.00050	mg/L	16-DEC-20	16-DEC-20	R5318591
Zinc (Zn)-Total		0.0319		0.0030	mg/L	16-DEC-20	16-DEC-20	R5318591
Zirconium (Zr)-Total		<0.00020		0.00020	mg/L	16-DEC-20	16-DEC-20	R5318591
Total Organic Carbon by Combustion								
Total Organic Carbon		9.74		0.50	mg/L		11-DEC-20	R5314856
Total Suspended Solids								
Total Suspended Solids		<3.0		3.0	mg/L		15-DEC-20	R5320056
pH								
pH		7.54		0.10	pH units		14-DEC-20	R5316576

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-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 transferred 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.			
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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
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 Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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 aqueous 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 Substrate 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 ww - 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.

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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	R5316576							
WG3461955-14 LCS								
Alkalinity, Total (as CaCO ₃)			96.4		%		85-115	14-DEC-20
WG3461955-11 MB								
Alkalinity, Total (as CaCO ₃)			<1.0		mg/L		1	14-DEC-20
BOD-CBOD-WP	Water							
Batch	R5318504							
WG3460377-7 LCS								
BOD Carbonaceous			100.5		%		85-115	11-DEC-20
WG3460377-6 MB								
BOD Carbonaceous			<2.0		mg/L		2	11-DEC-20
BOD-WP	Water							
Batch	R5318504							
WG3460377-7 LCS								
Biochemical Oxygen Demand			100.8		%		85-115	11-DEC-20
WG3460377-6 MB								
Biochemical Oxygen Demand			<2.0		mg/L		2	11-DEC-20
BTEXS+F1-HSMS-WP	Water							
Batch	R5319085							
WG3462095-2 LCS								
Benzene			106.0		%		70-130	16-DEC-20
Toluene			100.4		%		70-130	16-DEC-20
Ethyl benzene			102.2		%		70-130	16-DEC-20
o-Xylene			103.0		%		70-130	16-DEC-20
m+p-Xylenes			110.5		%		70-130	16-DEC-20
WG3462095-3 LCS								
F1 (C6-C10)			106.3		%		70-130	15-DEC-20
WG3462095-1 MB								
Benzene			<0.00050		mg/L		0.0005	15-DEC-20
Toluene			<0.0010		mg/L		0.001	15-DEC-20
Ethyl benzene			<0.00050		mg/L		0.0005	15-DEC-20
o-Xylene			<0.00050		mg/L		0.0005	15-DEC-20
m+p-Xylenes			<0.00040		mg/L		0.0004	15-DEC-20
F1 (C6-C10)			<0.10		mg/L		0.1	15-DEC-20
Surrogate: 4-Bromofluorobenzene (SS)			84.7		%		70-130	15-DEC-20
C-TOC-HTC-WP	Water							

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-TOC-HTC-WP	Water							
Batch	R5314856							
WG3461434-2	LCS							
Total Organic Carbon			103.5		%		80-120	11-DEC-20
WG3461434-1	MB							
Total Organic Carbon			<0.50		mg/L		0.5	11-DEC-20
CL-IC-N-WP	Water							
Batch	R5316642							
WG3460676-6	LCS							
Chloride (Cl)			98.1		%		90-110	11-DEC-20
WG3460676-5	MB							
Chloride (Cl)			<0.50		mg/L		0.5	11-DEC-20
E C-WP	Water							
Batch	R5316576							
WG3461955-13	LCS							
Conductivity			100.3		%		90-110	14-DEC-20
WG3461955-11	MB							
Conductivity			<1.0		umhos/cm		1	14-DEC-20
F-IC-N-WP	Water							
Batch	R5316642							
WG3460676-6	LCS							
Fluoride (F)			100.8		%		90-110	11-DEC-20
WG3460676-5	MB							
Fluoride (F)			<0.020		mg/L		0.02	11-DEC-20
F2-F4-FID-WP	Water							
Batch	R5320543							
WG3464574-2	LCS							
F2 (C10-C16)			96.9		%		70-130	19-DEC-20
F3 (C16-C34)			88.9		%		70-130	19-DEC-20
F4 (C34-C50)			91.3		%		70-130	19-DEC-20
WG3464574-1	MB							
F2 (C10-C16)			<0.10		mg/L		0.1	19-DEC-20
F3 (C16-C34)			<0.25		mg/L		0.25	19-DEC-20
F4 (C34-C50)			<0.25		mg/L		0.25	19-DEC-20
Surrogate: 2-Bromobenzotrifluoride			109.9		%		60-140	19-DEC-20
FC10-QT97-WP	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
FC10-QT97-WP	Water							
Batch R5312966								
WG3460736-2 DUP		L2539433-1						
Fecal Coliforms		2910	2490		MPN/100mL	16	65	11-DEC-20
WG3460736-1 MB								
Fecal Coliforms			<1		MPN/100mL		1	11-DEC-20
HG-T-CVAA-WP	Water							
Batch R5317622								
WG3462305-2 LCS								
Mercury (Hg)-Total			104.9		%		80-120	15-DEC-20
WG3462305-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	15-DEC-20
MET-T-CCMS-WP	Water							
Batch R5318591								
WG3462202-2 LCS								
Aluminum (Al)-Total			104.2		%		80-120	16-DEC-20
Antimony (Sb)-Total			103.7		%		80-120	16-DEC-20
Arsenic (As)-Total			104.5		%		80-120	16-DEC-20
Barium (Ba)-Total			102.9		%		80-120	16-DEC-20
Beryllium (Be)-Total			113.1		%		80-120	16-DEC-20
Bismuth (Bi)-Total			102.9		%		80-120	16-DEC-20
Boron (B)-Total			92.7		%		80-120	16-DEC-20
Cadmium (Cd)-Total			103.3		%		80-120	16-DEC-20
Calcium (Ca)-Total			108.0		%		80-120	16-DEC-20
Cesium (Cs)-Total			100.9		%		80-120	16-DEC-20
Chromium (Cr)-Total			105.0		%		80-120	16-DEC-20
Cobalt (Co)-Total			104.8		%		80-120	16-DEC-20
Copper (Cu)-Total			105.0		%		80-120	16-DEC-20
Iron (Fe)-Total			104.9		%		80-120	16-DEC-20
Lead (Pb)-Total			99.6		%		80-120	16-DEC-20
Lithium (Li)-Total			124.8	MES	%		80-120	16-DEC-20
Magnesium (Mg)-Total			112.8		%		80-120	16-DEC-20
Manganese (Mn)-Total			102.8		%		80-120	16-DEC-20
Molybdenum (Mo)-Total			102.1		%		80-120	16-DEC-20
Nickel (Ni)-Total			103.2		%		80-120	16-DEC-20
Potassium (K)-Total			110.9		%		80-120	16-DEC-20
Phosphorus (P)-Total			105.9		%		80-120	16-DEC-20
Rubidium (Rb)-Total			105.2		%		80-120	16-DEC-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R5318591							
WG3462202-2 LCS								
Selenium (Se)-Total			105.8		%		80-120	16-DEC-20
Silicon (Si)-Total			106.8		%		80-120	16-DEC-20
Silver (Ag)-Total			99.4		%		80-120	16-DEC-20
Sodium (Na)-Total			110.5		%		80-120	16-DEC-20
Strontium (Sr)-Total			103.5		%		80-120	16-DEC-20
Sulfur (S)-Total			101.8		%		80-120	16-DEC-20
Tellurium (Te)-Total			96.6		%		80-120	16-DEC-20
Thallium (Tl)-Total			100.4		%		80-120	16-DEC-20
Thorium (Th)-Total			97.7		%		80-120	16-DEC-20
Tin (Sn)-Total			100.9		%		80-120	16-DEC-20
Titanium (Ti)-Total			100.4		%		80-120	16-DEC-20
Tungsten (W)-Total			102.6		%		80-120	16-DEC-20
Uranium (U)-Total			95.8		%		80-120	16-DEC-20
Vanadium (V)-Total			106.1		%		80-120	16-DEC-20
Zinc (Zn)-Total			102.0		%		80-120	16-DEC-20
Zirconium (Zr)-Total			97.2		%		80-120	16-DEC-20
WG3462202-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	16-DEC-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	16-DEC-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	16-DEC-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	16-DEC-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	16-DEC-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	16-DEC-20
Boron (B)-Total			<0.010		mg/L		0.01	16-DEC-20
Cadmium (Cd)-Total			<0.000005C		mg/L		0.000005	16-DEC-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	16-DEC-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	16-DEC-20
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	16-DEC-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	16-DEC-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	16-DEC-20
Iron (Fe)-Total			<0.010		mg/L		0.01	16-DEC-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	16-DEC-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	16-DEC-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	16-DEC-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WP	Water							
Batch	R5318591							
WG3462202-1 MB								
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	16-DEC-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	16-DEC-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	16-DEC-20
Potassium (K)-Total			<0.050		mg/L		0.05	16-DEC-20
Phosphorus (P)-Total			<0.030		mg/L		0.03	16-DEC-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	16-DEC-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	16-DEC-20
Silicon (Si)-Total			<0.10		mg/L		0.1	16-DEC-20
Silver (Ag)-Total			<0.000010		mg/L		0.00001	16-DEC-20
Sodium (Na)-Total			<0.050		mg/L		0.05	16-DEC-20
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	16-DEC-20
Sulfur (S)-Total			<0.50		mg/L		0.5	16-DEC-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	16-DEC-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	16-DEC-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	16-DEC-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	16-DEC-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	16-DEC-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	16-DEC-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	16-DEC-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	16-DEC-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	16-DEC-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	16-DEC-20
NH3-COL-WP	Water							
Batch	R5313279							
WG3461020-26 LCS								
Ammonia, Total (as N)			97.4		%		85-115	11-DEC-20
WG3461020-25 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	11-DEC-20
N02-IC-N-WP	Water							
Batch	R5316642							
WG3460676-6 LCS								
Nitrite (as N)			100.3		%		90-110	11-DEC-20
WG3460676-5 MB								
Nitrite (as N)			<0.010		mg/L		0.01	11-DEC-20
N03-IC-N-WP	Water							

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
N03-IC-N-WP	Water							
Batch	R5316642							
WG3460676-6	LCS							
Nitrate (as N)			98.7		%		90-110	11-DEC-20
WG3460676-5	MB							
Nitrate (as N)			<0.020		mg/L		0.02	11-DEC-20
OG-GRAV-WP	Water							
Batch	R5320022							
WG3463986-2	LCS							
Oil and Grease			98.4		%		70-130	18-DEC-20
WG3463986-1	MB							
Oil and Grease			<5.0		mg/L		5	18-DEC-20
P-T-COL-WP	Water							
Batch	R5318657							
WG3463251-2	LCS							
Phosphorus (P)-Total			97.8		%		80-120	17-DEC-20
WG3463251-1	MB							
Phosphorus (P)-Total			<0.0030		mg/L		0.003	17-DEC-20
PAH-CCME-PPM-WT	Water							
Batch	R5320919							
WG3463982-2	LCS							
1-Methyl Naphthalene			95.2		%		50-150	22-DEC-20
2-Methyl Naphthalene			95.3		%		50-150	22-DEC-20
Acenaphthene			100.6		%		50-150	22-DEC-20
Acenaphthylene			93.4		%		50-150	22-DEC-20
Anthracene			82.4		%		50-150	22-DEC-20
Acridine			65.4		%		50-150	22-DEC-20
Benzo(a)anthracene			83.8		%		50-150	22-DEC-20
Benzo(a)pyrene			88.4		%		50-150	22-DEC-20
Benzo(b&j)fluoranthene			82.7		%		50-150	22-DEC-20
Benzo(g,h,i)perylene			97.9		%		50-150	22-DEC-20
Benzo(k)fluoranthene			89.4		%		50-150	22-DEC-20
Chrysene			86.6		%		50-150	22-DEC-20
Dibenzo(a,h)anthracene			90.4		%		50-150	22-DEC-20
Fluoranthene			96.8		%		50-150	22-DEC-20
Fluorene			93.4		%		50-150	22-DEC-20
Indeno(1,2,3-cd)pyrene			104.8		%		50-150	22-DEC-20
Naphthalene			95.1		%		50-150	22-DEC-20

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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-CCME-PPM-WT	Water							
Batch	R5320919							
WG3463982-2	LCS							
Phenanthrene			95.9		%		50-150	22-DEC-20
Pyrene			97.7		%		50-150	22-DEC-20
Quinoline			107.8		%		50-150	22-DEC-20
WG3463982-1	MB							
1-Methyl Naphthalene			<0.000020		mg/L		0.00002	22-DEC-20
2-Methyl Naphthalene			<0.000020		mg/L		0.00002	22-DEC-20
Acenaphthene			<0.000020		mg/L		0.00002	22-DEC-20
Acenaphthylene			<0.000020		mg/L		0.00002	22-DEC-20
Anthracene			<0.000010		mg/L		0.00001	22-DEC-20
Acridine			<0.000020		mg/L		0.00002	22-DEC-20
Benzo(a)anthracene			<0.000010		mg/L		0.00001	22-DEC-20
Benzo(a)pyrene			<0.000005C		mg/L		0.000005	22-DEC-20
Benzo(b&j)fluoranthene			<0.000010		mg/L		0.00001	22-DEC-20
Benzo(g,h,i)perylene			<0.000020		mg/L		0.00002	22-DEC-20
Benzo(k)fluoranthene			<0.000010		mg/L		0.00001	22-DEC-20
Chrysene			<0.000020		mg/L		0.00002	22-DEC-20
Dibenzo(a,h)anthracene			<0.000005C		mg/L		0.000005	22-DEC-20
Fluoranthene			<0.000020		mg/L		0.00002	22-DEC-20
Fluorene			<0.000020		mg/L		0.00002	22-DEC-20
Indeno(1,2,3-cd)pyrene			<0.000010		mg/L		0.00001	22-DEC-20
Naphthalene			<0.000050		mg/L		0.00005	22-DEC-20
Phenanthrene			<0.000050		mg/L		0.00005	22-DEC-20
Pyrene			<0.000010		mg/L		0.00001	22-DEC-20
Quinoline			<0.000020		mg/L		0.00002	22-DEC-20
Surrogate: d8-Naphthalene			98.4		%		50-150	22-DEC-20
Surrogate: d10-Phenanthrene			96.6		%		50-150	22-DEC-20
Surrogate: d12-Chrysene			79.5		%		50-150	22-DEC-20
Surrogate: d10-Acenaphthene			97.0		%		50-150	22-DEC-20
Surrogate: d9-Acridine (SS)			66.4		%		50-150	22-DEC-20
PH-WP	Water							
Batch	R5316576							
WG3461955-12	LCS							
pH			7.08		pH units		6.9-7.1	14-DEC-20
PHENOLS-4AAP-WT	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PHENOLS-4AAP-WT	Water							
Batch	R5320090							
WG3463881-2	LCS							
Phenols (4AAP)			105.8		%		85-115	18-DEC-20
WG3463881-1	MB							
Phenols (4AAP)			<0.0010		mg/L		0.001	18-DEC-20
S04-IC-N-WP	Water							
Batch	R5316642							
WG3460676-6	LCS							
Sulfate (SO4)			99.7		%		90-110	11-DEC-20
WG3460676-5	MB							
Sulfate (SO4)			<0.30		mg/L		0.3	11-DEC-20
SOLIDS-TOTSUS-WP	Water							
Batch	R5320056							
WG3462025-6	DUP	L2539433-1						
Total Suspended Solids		<3.0	<3.0	RPD-NA	mg/L	N/A	20	15-DEC-20
WG3462025-5	LCS							
Total Suspended Solids			105.9		%		85-115	15-DEC-20
WG3462025-4	MB							
Total Suspended Solids			<3.0		mg/L		3	15-DEC-20
TC,EC10-QT97-WP	Water							
Batch	R5312969							
WG3460726-2	DUP	L2539433-1						
Total Coliforms		>24200	>24200		MPN/100mL	0.0	65	11-DEC-20
Escherichia Coli		3280	2490		MPN/100mL	27	65	11-DEC-20
WG3460726-1	MB							
Total Coliforms			<1		MPN/100mL		1	11-DEC-20
Escherichia Coli			<1		MPN/100mL		1	11-DEC-20

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Legend:

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

Sample Parameter Qualifier Definitions:

Qualifier	Description
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

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Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Total Suspended Solids	1	07-DEC-20 10:30	15-DEC-20 10:00	7	8	days	EHT
pH	1	07-DEC-20 10:30	14-DEC-20 12:00	0.25	169	hours	EHTR-FM
Anions and Nutrients							
Nitrate in Water by IC	1	07-DEC-20 10:30	11-DEC-20 12:00	3	4	days	EHTR
Nitrite in Water by IC	1	07-DEC-20 10:30	11-DEC-20 12:00	3	4	days	EHTR
Bacteriological Tests							
Fecal coliforms, 1:10 dilution by QT97	1	07-DEC-20 10:30	11-DEC-20 14:40	30	100	hours	EHTR
Total and E. coli, 1:10 dilution by QT97	1	07-DEC-20 10:30	11-DEC-20 14:40	30	100	hours	EHTR
Aggregate Organics							
Biochemical Oxygen Demand (BOD)	1	07-DEC-20 10:30	11-DEC-20 07:00	48	92	hours	EHTR
Carbonaceous BOD	1	07-DEC-20 10:30	11-DEC-20 07:00	48	92	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 L2539433 were received on 11-DEC-20 11:20.

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.

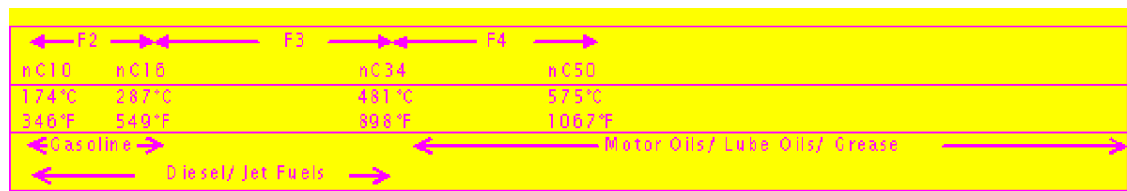
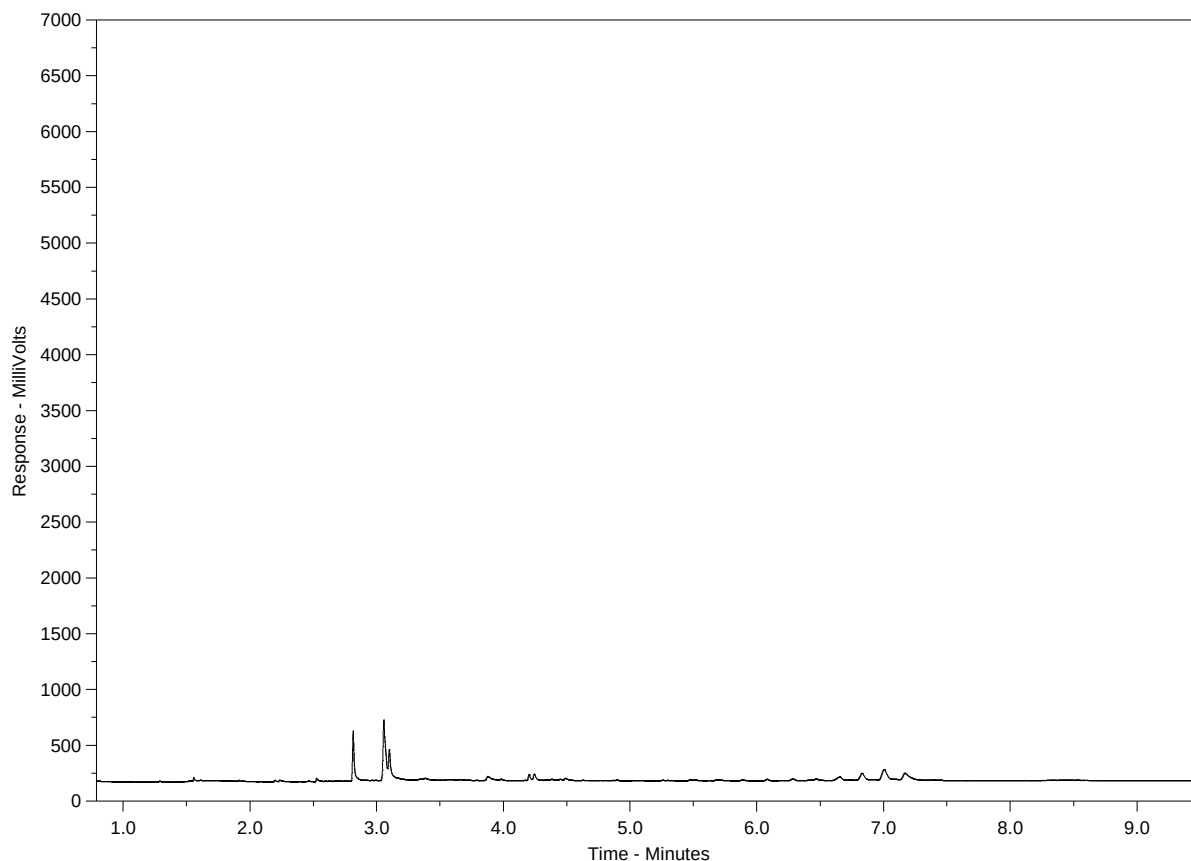
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide 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: L2539433-1
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.

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Appendix C: Summary of Hydrocarbon Contamination Analysis

Summary of Hydrocarbon Contamination Analysis 2020
Licence No. 3AM-GRA1624 (GRA-1, GRA-6, GRA-7)

Parameters	Units	Detection Limit	25-Jun-20			Guidelines for Canadian Drinking Water Quality
			GRA-1: Nipissar Lake	GRA-6: Char River	GRA-7: Lower Landing Lake	
BTX plus F1 by GCMS						
Benzene	mg/L	0.00050	<0.00050	<0.00050	<0.00050	MAC: 0.005 mg/L
Toluene	mg/L	0.0010	<0.0010	<0.0010	<0.0010	AO: ≤ 0.024 mg/L ¹
Ethylbenzene	mg/L	0.00050	<0.00050	<0.00050	<0.00050	AO: ≤ 0.0024 mg/L ²
o-Xylene	mg/L	0.00050	<0.00050	<0.00050	<0.00050	
m+p-Xylenes	mg/L	0.00040	<0.00040	<0.00040	<0.00040	
F1 (C6-C10)	mg/L	0.10	<0.10	<0.10	<0.10	
CCME Total Hydrocarbons						
F1-BTEX	mg/L	0.10	N/A	N/A	N/A	
F2-Naphth	mg/L	0.1	N/A	N/A	N/A	
F3-PAH	mg/L	0.25	N/A	N/A	N/A	
Total Hydrocarbons (C6-C50)	mg/L	0.38	N/A	N/A	N/A	
F2-F4 PHC Method						
F2 (C10-C16)	mg/L	0.1	<0.10	<0.10	<0.10	
F3 (C16-C34)	mg/L	0.25	<0.25	<0.25	<0.25	
F4 (C34-C50)	mg/L	0.25	<0.25	<0.25	<0.25	
Sum of Xylene Isomer Concentrations						
Xylenes (Total)	mg/L	0.00064	<0.00064	<0.00064	<0.00064	AO: ≤ 0.3 mg/L ³
Polyaromatic Hydrocarbons (PAHs)						
1-Methyl Napthalene	mg/L	0.000020	N/A	N/A	N/A	
2-Methyl Napthalene	mg/L	0.000020	N/A	N/A	N/A	
Acenaphthene	mg/L	0.000020	<0.000020	<0.000020	<0.000020	
Acenaphthylene	mg/L	0.000020	<0.000020	<0.000020	<0.000020	
Anthracene	mg/L	0.000020	<0.000020	<0.000020	<0.000020	
Acridine	mg/L	0.000020	N/A	N/A	N/A	
Benzo(a)anthracene	mg/L	0.000020	<0.000020	<0.000020	<0.000020	
Benzo(a)pyrene	mg/L	0.0000050	<0.0000050	<0.0000050	<0.0000050	MAC: 0.00001 mg/L
Benzo(b&j)fluoranthene	mg/L	0.000020	<0.000020	<0.000020	<0.000020	
Benzo(g,h,i)perylene	mg/L	0.000020	<0.000020	<0.000020	<0.000020	
Benzo(k)fluoranthene	mg/L	0.000020	<0.000020	<0.000020	<0.000020	
Chrysene	mg/L	0.000020	<0.000020	<0.000020	<0.000020	
Dibenzo(a,h)anthracene	mg/L	0.0000020	<0.000020	<0.000020	<0.000020	
Fluoranthene	mg/L	0.000020	<0.000020	<0.000020	<0.000020	
Fluorene	mg/L	0.000020	<0.000020	<0.000020	<0.000020	
Indeno(1,2,3-cd)pyrene	mg/L	0.000020	<0.000020	<0.000020	<0.000020	
Naphthalene	mg/L	0.000020	<0.000020	<0.000020	<0.000020	
Phenanthrene	mg/L	0.000020	<0.000020	<0.000020	<0.000020	
Pyrene	mg/L	0.000020	<0.000020	<0.000020	<0.000020	
Quinoline	mg/L	0.000020	N/A	N/A	N/A	
B(a)P Total Potency Equivalent	mg/L	0.000030	N/A	N/A	N/A	

MAC - Maximum acceptable concentrations (health based)
AO - Aesthetic objectives (based on aesthetic considerations)
OG - Operational guidance values (based on operational considerations)

¹ AO based on odour

² AO based on odour; levels above the AO would render drinking water unpalatable

³ AO based on taste and odour; levels above the AO would render water unpalatable

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Appendix D: Hazardous Materials Spill Database, Rankin Inlet 2020

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Spill	Occurance Date -	Spill Region	Location	Location Description	Product Spilled	Quantity	Measurement	Spill Cause	Lead Agency
spill-2020440	November 17, 2020	Keewatin	Rankin Inlet, Community, Nunavut	Meliadine Gold Project	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	Unknown Quantity		Other	CIRNAC - Crown-Indigenous Relations and Northern Affairs Canada
spill-2020434	November 1, 2020	Keewatin	Rankin Inlet, Community, Nunavut	Rankin Inlet - Calm Air Airport	Chemicals (including transformer oils)	Unknown Quantity		Other	GN - Government of Nunavut
spill-2020414	October 22, 2020	Keewatin	Rankin Inlet, Community, Nunavut	lot 2, plan 603 Rankin Inlet	Petroleum - waste oil (slops, sludge)	150.00	Litres	Collision or Crash	GN - Government of Nunavut
spill-2020372	October 1, 2020	Keewatin	Rankin Inlet, Community, Nunavut	N/A	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	75.00	Litres	Other	GN - Government of Nunavut
spill-2020320	September 6, 2020	Keewatin	Rankin Inlet, Community, Nunavut	Rankin Inlet Housing Asso PO box 160 Rankin Inlet	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	302.00	Litres	Tank Leak	GN - Government of Nunavut
spill-2020183	June 16, 2020	Keewatin	Rankin Inlet, Community, Nunavut	209-69 Pukkinnik (69th) Street	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	20.00	Litres	Breakage	GN - Government of Nunavut
spill-2020186	May 19, 2020	Keewatin	Rankin Inlet, Community, Nunavut	21-21 Titiganiaq Street	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	200.00	Litres	Pipe Leaks	GN - Government of Nunavut
spill-2020103	April 17, 2020	Keewatin	Rankin Inlet, Community, Nunavut	Maani Ulujuk Ilinniarvik	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	18400.00	Litres	Overflow Event	GN - Government of Nunavut

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FOR GN-CGS RANKIN INLET**

Appendix E: CIRNAC Inspection Report



WATER LICENCE INSPECTION FORM

☒ Original

☐ Follow-Up Report

Licensee	Licensee Representative
Community and Government Services	Megan Lusty
Licence No. / Expiry	Representative's Title
3AM-GRA1624/ May 1st, 2024	Manager, Municipal Works
Land / Other Authorizations	Land / Other Authorizations
--	--
Date of Inspection	Inspector
August 11 th 2020	Atuat Shouldice
Activities Inspected	
☐ Camp☐ Drilling☐ Mining☐ Construction☐ Reclamation☐ Fuel Storage ☐ Roads/Hauling☒ Other: Waste Disposal Facility☒ Other: Water Treatment Facility	

SECTION 1

☒ Comments (s. 1_)

☐ Non-Compliance with Act or Licence (s.)

☐ Action Required (s.)

BACKGROUND

On August 11th 2020, a regularly scheduled inspection was conducted of the Nunavut Water Board’s (NWB) water licence no. 3AM-GRA1624 issued to the Government of Nunavut, Community and Government Services (CGS) for the use of water related to the fresh water intake, re-supply line, Water Treatment Plant (WTP) and Sewage Treatment Facility (STF). The inspection was conducted to ensure compliance with applicable terms and conditions of the licence.

Observation

1. The 2019 Annual Report is available for review on the NWB’s website.

2. Fresh water is drawn from Nipisar Lake at monitoring station GRA-1.

3. The total water used in 2019 according Annual Report was 630,094 m³ which respected the annual allotment of 850,000 m³.

4. In 2019 a concern was noted at the Nipisar Lake, Water Intake regarding the fuel tank and line. The tank and line have since been replaced.

5. Sewage sludge is deposited at a rate of 1 cubic meter per week, into a designated area at the municipal Landfill.

6. All signage is posted as required by PART B item 5.

CZSECTION 2

☐ Comments

☒ Non-Compliance with Act or Licence

☐ Action Required

Concerns related to Water Licence no. 3AM-GRA1624;

— No concerns noted at this time.

SECTION 3

☐ Comments

☐ Non-Compliance with Act or Licence

☒ Action Required

The Government of Nunavut continues to work towards improving the fresh water supply. An amendment has been recently to the Nunavut Water Board submitted to capture the an increase re-supply pumping from Landing Lake.

Licensee or Representative	Inspector's Name
Megan Lusty	Atuat Shouldice
Signature	Signature
	Sent Electronically
Date	Date
	December 10 th 2020

CC:

Licensing Department, NWB
Justin Hack, Manager of Field Operations, CIRNAC
Megan Lusty, Municipal Works, CGS



PHOTO LOG

Date:	Authorization Number:	Camera/Model:	Inspector
August 11th, 2020	3AM-GRA1624	Samsung S9	RMO Shouldice
Photo No.		Lat/Long (DD.MM.SS.SS, NAD83)	
Photo 1		With in municipality	
Description:			
Pump house with new fuel tank and fuel line.			





Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo 2	With in municipality
Description: Pump house with new fuel tank and fuel line.	



Relations Couronne-Autochtones
et Affaires du Nord Canada

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo 3	With in municipality
Description: Pump log sheets in to Nipisar lake	

[illegible]

**ANNUAL REPORT
FOR GN-CGS RANKIN INLET**

Appendix F: Licensee Representative Annual Inspection Report

2020 Municipal Water Licence Inspection – GN-CGS

The inspection took place on Monday August 10th with Atuat Shouldice (CIRNAC inspector) and Connor Faulkner (CGS representative) present. Wastewater samples were not taken at compliance points during the inspection. Some points brought forth by the inspector were:

- Removal of the silt screen at compliance point GRA-6 along the riverbank. CGS representative Connor Faulkner mentioned this is believed to be materials leftover from the old bridge put in at Char River by the Canadian Military which was confirmed by CGS facility manager Joe Strickland (August 12, 2020).
- The inspector was happy to see the underground fuel pipeline from the tank at the Nipissar Lake pumphouse changed to an above ground pipeline with a new tank installed (as concern was raised during the the 2019 inspection).