

ANNUAL REPORT FOR THE HAMLET OF ARVIAT

YEAR BEING REPORTED: 2019

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water Licence No. **3AM-ARV1016** issued to the **Hamlet of Arviat**.

- i)- iii) tabular summaries of all data generated under the "Monitoring Program"; monthly and annual quantities in cubic metres of freshwater obtained from all sources; monthly and annual quantities in cubic metres of each and all wastes discharged;

Attached are results for Monitoring Stations ARV-1, as well as detailed chemical, physical and biological analysis required at ARV-2a, ARV-4, ARV-5 and ARV-6 (for the months of July to September).

Month Reported	Quantity of Water Obtained from all sources (m³)	Quantity of Sewage Waste Discharged (m³)
January	8,773.981	Same
February	8,183.761	Same
March	8,653.599	Same
April	8,388.011	Same
May	8,886.973	Same
June	8,174.513	Same
July	9,095.633	Same
August	9,218.575	Same
September	8,742.782	Same
October	9,026.433	Same
November	8,693.879	Same
December	8,767.896	Same
ANNUAL TOTAL	104,606.04	

Note: No meter exists to measure the sewage discharge volume, therefore water consumption volume is considered as equal volume to the Sewage discharge volume.

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- iv. a summary of modifications and/or major maintenance work carried out on the Water Supply and Waste Disposal Facilities, including all associated structures and facilities;
- Vehicles, old sewage tanks, and tires were shredded for disposal by a metals shredder bought by the Hamlet of Arviat.
 - Segregation continues to improve at the Solid Waste Site and Bulky Metals Site. Batteries are collected and being stored in a sea can. The Hamlet is working on getting these sent out on a ship as the sea can that contains them is full.
 - The Solid Waste Site is improving drastically; there are currently minor piles of wood and waste within the fenced area.
 - A new water treatment plant and new water reservoir was constructed and commissioned in November 2019.



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- v. a list of unauthorized discharges and summary of follow-up action taken;

The following spills were reported to the NT-NU Spill Report Line and are listed on the Hazardous Materials Spills Database for Arviat in 2019:

Spill	Occurrence Date	Location Description	Product Spilled	Quantity
spill-2019329	20-Aug-19	Arviat Power Plant	Petroleum - lubricating oil (lube, hydraulic)	400L
spill-2019237	07-Jun-19	300 7th Avenue, Arviat, NU	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	Unknown Quantity
spill-2019182	02-May-19	400 10th Avenue	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	1620L

- vi. a summary of any abandonment and restoration work completed during the year and an outline of any work anticipated for the next year;

- A new water treatment plant and water reservoir was constructed and commissioned in November 2019.
- Associated Engineering was engaged to complete a hydrological assessment of Wolf Creek to determine the sustainability of continuing its use as the community's water source, and to look at options for accessing the site earlier in the season.
- The GN has engaged Nunami Stantec Limited to complete two feasibility studies; one for an upgraded Wastewater Treatment Lagoon, and the second for an upgraded Solid Waste Management Site. The study is scheduled to be completed in September, 2020.

- vii. a summary of any studies requested by the Board that relate to waste disposal, water use or reclamation, and a brief description of any future studies planned;

- none

- viii. any other details on water use or waste disposal requested by the Board by November 1st of the year being reported; and

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- Decanting of the old sewage lagoon was approved by CIRNAC on May 24, 2019. They will decant, desludge, and expand their SWS in future years.
- ix. updates or revisions to the approved Operation and Maintenance Plans.
- New Water Treatment Plant O&M Manual will be submitted once finalized and received.

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

-
- The Hamlet is working with the Water Compliance Working Group to implement the Solid Waste Workplan goals.

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

-
- The 3AM-ARV1016 CIRNAC Inspection took place on July 12th, 2019. A copy of the inspection report has not been received to date.

Appendix A: ARV-4 Effluent Quality Limits – 1 page

Appendix B: Weekly Inspections at Monitoring Program Stations – 1 page

Appendix C: Certificate of Analysis June 13, 2019– 18 pages

Certificate of Analysis July 7, 2019 – 18 pages

Certificate of Analysis August 26, 2019 – 18 pages

Certificate of Analysis September 20, 2019 – 18 pages

Appendix D: Hazardous Materials Spill Database, Arviat 2019 – 1 page

Appendix E: Arviat 2019 Sampling Summary – 4 pages

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Appendix A

3AM-ARV1016 Arviat Monitoring Program Results 2019**Part D, Item 2; ARV-4 Effluent Quality limits**

Parameter	Maximum Concentration of any grab sample	ARV-4		
		13-Jun-19	07-Jul-19	26-Aug-19
BOD ₅	80 mg/L	22.4	65	27.1
Total Suspended Solids	100 mg/L	15.9	45.8	138
Fecal Coliforms	1 x 10 ⁴ CFU/100mL	19900	>24200	5790
Oil & Grease	no visible sheen	<5.0	11.7	<5.0
pH	between 6 and 9	7.47	7.66	8.34

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Appendix B

Nunavut Water Board Licence No. 3AM-ARV1016

Arviat, NU

Part H, Item 8: Weekly Inspections at Monitoring Program Stations, May to August

ARV 2 - Near Garbage
ARV 4 - Beyond Lagoon
ARV 5 - Near Metal Dumps
ARV 6 - Near Garage

Week	Starting Date	ARV-2a			ARV-4			ARV-5			ARV-6			Checked By
		Water Present (check)			Water Present (check)			Water Present (check)			Water Present (check)			
		Yes	No	Frozen	Yes	No	Frozen	Yes	No	Frozen	Yes	No	Frozen	
1	29-Apr-19			/			/			/			/	Laura
2	06-May-19			/			/			/			/	Laura
3	13-May-19			/			/			/			/	Laura
4	20-May-19			/			/			/			/	Laura
5	27-May-19	/			/			/					/	Laura
6	03-Jun-19	✓			✓			✓				Snow		Laura
7	10-Jun-19	✓			✓			✓				Snow		Laura
8	17-Jun-19	✓			✓			✓				Snow		Laura
9	24-Jun-19	✓			✓			✓			✓			Laura
10	01-Jul-19	✓			✓			✓			✓			Laura
11	08-Jul-19	✓			✓			✓			✓			Laura
12	15-Jul-19	✓			✓			✓			✓			Laura
13	22-Jul-19	✓			✓			✓			✓			Laura
14	29-Jul-19	✓			✓			✓			✓			Laura
15	05-Aug-19	✓			✓			✓			✓			Laura
16	12-Aug-19	✓			✓			✓			✓			Laura
17	19-Aug-19	✓			✓			✓			✓			Laura
18	26-Aug-19	✓			✓			✓			✓			Laura

lots of water
lots of water
lots of water
lots of water

Monitoring Program Station Locations:

- ARV-2a: Effluent discharge from the Discharge Point of the Solid Waste Disposal Facility
- ARV-4: Effluent from the discharge point of the Sewage Disposal Facility (end of wetland)
- ARV-5: Discharge from the Bulky Metal Waste Area
- ARV-6: Discharge from the Hazardous Waste Storage Area

* Fax Sheets Weekly to Connor Faulkner at CGS- Rankin Inlet. Fax: (867) 645-8143

There seems to be
lots of water in
August.

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Appendix C



Hamlet of Arviat
ATTN: STEVE ENGLAND
PO Box 150
Arviat NU X0C 0E0

Date Received: 14-JUN-19
Report Date: 29-JUN-19 10:06 (MT)
Version: FINAL

Client Phone: 867-857-2841

Certificate of Analysis

Lab Work Order #: L2291847
Project P.O. #: NOT SUBMITTED
Job Reference:
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
L2291847-1 ARV-2							
Sampled By: CLIENT on 13-JUN-19 @ 10:00							
Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050	RRR	0.00050	mg/L		19-JUN-19	R4682726
Toluene	<0.0010	RRR	0.0010	mg/L		19-JUN-19	R4682726
Ethyl benzene	<0.00050	RRR	0.00050	mg/L		19-JUN-19	R4682726
o-Xylene	<0.00050	RRR	0.00050	mg/L		19-JUN-19	R4682726
m+p-Xylenes	<0.00040	RRR	0.00040	mg/L		19-JUN-19	R4682726
F1 (C6-C10)	<0.10	RRR	0.10	mg/L		19-JUN-19	R4682726
Surrogate: 4-Bromofluorobenzene (SS)	92.0		70-130	%		19-JUN-19	R4682726
Note: Note: Sample received with headspace. Results may be biased low.							
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	18-JUN-19	21-JUN-19	R4687788
F3 (C16-C34)	<0.25		0.25	mg/L	18-JUN-19	21-JUN-19	R4687788
F4 (C34-C50)	<0.25		0.25	mg/L	18-JUN-19	21-JUN-19	R4687788
Surrogate: 2-Bromobenzotrifluoride	121.5		60-140	%	18-JUN-19	21-JUN-19	R4687788
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		29-JUN-19	
F2-Naphth	<0.10		0.10	mg/L		29-JUN-19	
F3-PAH	<0.25		0.25	mg/L		29-JUN-19	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		29-JUN-19	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		29-JUN-19	
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	19-JUN-19	20-JUN-19	R4684786
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	19-JUN-19	20-JUN-19	R4684786
Acenaphthene	<0.000020		0.000020	mg/L	19-JUN-19	20-JUN-19	R4684786
Acenaphthylene	<0.000020		0.000020	mg/L	19-JUN-19	20-JUN-19	R4684786
Anthracene	<0.000010		0.000010	mg/L	19-JUN-19	20-JUN-19	R4684786
Acridine	<0.000020		0.000020	mg/L	19-JUN-19	20-JUN-19	R4684786
Benzo(a)anthracene	<0.000010		0.000010	mg/L	19-JUN-19	20-JUN-19	R4684786
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	19-JUN-19	20-JUN-19	R4684786
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	19-JUN-19	20-JUN-19	R4684786
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	19-JUN-19	20-JUN-19	R4684786
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	19-JUN-19	20-JUN-19	R4684786
Chrysene	<0.000020		0.000020	mg/L	19-JUN-19	20-JUN-19	R4684786
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	19-JUN-19	20-JUN-19	R4684786
Fluoranthene	<0.000020		0.000020	mg/L	19-JUN-19	20-JUN-19	R4684786
Fluorene	<0.000020		0.000020	mg/L	19-JUN-19	20-JUN-19	R4684786
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	19-JUN-19	20-JUN-19	R4684786
Naphthalene	<0.000050		0.000050	mg/L	19-JUN-19	20-JUN-19	R4684786
Phenanthrene	<0.000050		0.000050	mg/L	19-JUN-19	20-JUN-19	R4684786
Pyrene	<0.000010		0.000010	mg/L	19-JUN-19	20-JUN-19	R4684786
Quinoline	<0.000020		0.000020	mg/L	19-JUN-19	20-JUN-19	R4684786
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	19-JUN-19	20-JUN-19	R4684786
Surrogate: Acenaphthene d10	66.3		60-130	%	19-JUN-19	20-JUN-19	R4684786
Surrogate: Acridine d9	60.4		60-130	%	19-JUN-19	20-JUN-19	R4684786
Surrogate: Chrysene d12	62.7		60-130	%	19-JUN-19	20-JUN-19	R4684786
Surrogate: Naphthalene d8	57.7		50-130	%	19-JUN-19	20-JUN-19	R4684786
Surrogate: Phenanthrene d10	60.9		60-130	%	19-JUN-19	20-JUN-19	R4684786
Nunavut WW Group 1							
Alkalinity, Bicarbonate							

* 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
L2291847-1 ARV-2							
Sampled By: CLIENT on 13-JUN-19 @ 10:00							
Matrix: WATER							
Alkalinity, Bicarbonate							
Bicarbonate (HCO ₃)	160		1.2	mg/L		19-JUN-19	
Alkalinity, Carbonate							
Carbonate (CO ₃)	<0.60		0.60	mg/L		19-JUN-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		19-JUN-19	
Alkalinity, Total (as CaCO₃)							
Alkalinity, Total (as CaCO ₃)	132		1.0	mg/L		18-JUN-19	R4673671
Ammonia by colour							
Ammonia, Total (as N)	2.24		0.10	mg/L		19-JUN-19	R4678331
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	10.4		2.0	mg/L		15-JUN-19	R4682354
Carbonaceous BOD							
BOD Carbonaceous	8.2		2.0	mg/L		15-JUN-19	R4682354
Chloride in Water by IC							
Chloride (Cl)	142		1.0	mg/L		14-JUN-19	R4673753
Conductivity							
Conductivity	1030		1.0	umhos/cm		18-JUN-19	R4673671
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	230	MBHT	10	MPN/100mL		14-JUN-19	R4671347
Hardness Calculated							
Hardness (as CaCO ₃)	289	HTC	0.20	mg/L		21-JUN-19	
Mercury Total							
Mercury (Hg)-Total	0.0000060		0.0000050	mg/L	15-JUN-19	17-JUN-19	R4672470
Nitrate in Water by IC							
Nitrate (as N)	0.501		0.040	mg/L		14-JUN-19	R4673753
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.534		0.070	mg/L		19-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	0.033		0.020	mg/L		14-JUN-19	R4673753
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		20-JUN-19	R4677328
Phenol (4AAP)							
Phenols (4AAP)	0.0016		0.0010	mg/L		18-JUN-19	R4673366
Phosphorus, Total							
Phosphorus (P)-Total	0.320		0.0030	mg/L		18-JUN-19	R4672439
Sulfate in Water by IC							
Sulfate (SO ₄)	164		0.60	mg/L		14-JUN-19	R4673753
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0680		0.0030	mg/L	20-JUN-19	20-JUN-19	R4680212
Arsenic (As)-Total	0.00223		0.00010	mg/L	20-JUN-19	20-JUN-19	R4680212
Cadmium (Cd)-Total	0.0000929		0.0000050	mg/L	20-JUN-19	20-JUN-19	R4680212
Calcium (Ca)-Total	82.4		0.050	mg/L	20-JUN-19	20-JUN-19	R4680212
Chromium (Cr)-Total	0.00045		0.00010	mg/L	20-JUN-19	20-JUN-19	R4680212
Cobalt (Co)-Total	0.00098		0.00010	mg/L	20-JUN-19	20-JUN-19	R4680212
Copper (Cu)-Total	0.0145		0.00050	mg/L	20-JUN-19	20-JUN-19	R4680212
Iron (Fe)-Total	0.501		0.010	mg/L	20-JUN-19	20-JUN-19	R4680212
Lead (Pb)-Total	0.000671		0.000050	mg/L	20-JUN-19	20-JUN-19	R4680212
Magnesium (Mg)-Total	20.3		0.0050	mg/L	20-JUN-19	20-JUN-19	R4680212
Manganese (Mn)-Total	0.246		0.00010	mg/L	20-JUN-19	20-JUN-19	R4680212
Nickel (Ni)-Total	0.00384		0.00050	mg/L	20-JUN-19	20-JUN-19	R4680212
Potassium (K)-Total	15.7		0.050	mg/L	20-JUN-19	20-JUN-19	R4680212
Sodium (Na)-Total	94.9		0.050	mg/L	20-JUN-19	20-JUN-19	R4680212

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

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2291847-2 ARV-4							
Sampled By: CLIENT on 13-JUN-19 @ 09:40							
Matrix: WATER							
Polyaromatic Hydrocarbons (PAHs)							
Phenanthrene	<0.000050		0.000050	mg/L	19-JUN-19	20-JUN-19	R4684786
Pyrene	<0.000010		0.000010	mg/L	19-JUN-19	20-JUN-19	R4684786
Quinoline	<0.000020		0.000020	mg/L	19-JUN-19	20-JUN-19	R4684786
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	19-JUN-19	20-JUN-19	R4684786
Surrogate: Acenaphthene d10	65.3		60-130	%	19-JUN-19	20-JUN-19	R4684786
Surrogate: Acridine d9	62.7		60-130	%	19-JUN-19	20-JUN-19	R4684786
Surrogate: Chrysene d12	63.2		60-130	%	19-JUN-19	20-JUN-19	R4684786
Surrogate: Naphthalene d8	54.0		50-130	%	19-JUN-19	20-JUN-19	R4684786
Surrogate: Phenanthrene d10	61.0		60-130	%	19-JUN-19	20-JUN-19	R4684786
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	159		1.2	mg/L		19-JUN-19	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		19-JUN-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		19-JUN-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	131		1.0	mg/L		18-JUN-19	R4673671
Ammonia by colour							
Ammonia, Total (as N)	19.6		0.50	mg/L		19-JUN-19	R4678331
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	22.4		6.0	mg/L		15-JUN-19	R4682354
Carbonaceous BOD							
BOD Carbonaceous	12.6		2.0	mg/L		15-JUN-19	R4682354
Chloride in Water by IC							
Chloride (Cl)	154		1.0	mg/L		14-JUN-19	R4673753
Conductivity							
Conductivity	832		1.0	umhos/cm		18-JUN-19	R4673671
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	19900	MBHT	10	MPN/100mL		14-JUN-19	R4671347
Hardness Calculated							
Hardness (as CaCO3)	98.8	HTC	0.20	mg/L		21-JUN-19	
Mercury Total							
Mercury (Hg)-Total	0.0000100		0.0000050	mg/L	15-JUN-19	17-JUN-19	R4672470
Nitrate in Water by IC							
Nitrate (as N)	0.173		0.040	mg/L		14-JUN-19	R4673753
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.173		0.070	mg/L		19-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		14-JUN-19	R4673753
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		20-JUN-19	R4677328
Phenol (4AAP)							
Phenols (4AAP)	0.0072		0.0010	mg/L		18-JUN-19	R4673366
Phosphorus, Total							
Phosphorus (P)-Total	4.36		0.030	mg/L		18-JUN-19	R4672439
Sulfate in Water by IC							
Sulfate (SO4)	22.0		0.60	mg/L		14-JUN-19	R4673753
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.113		0.0030	mg/L	20-JUN-19	20-JUN-19	R4680212
Arsenic (As)-Total	0.00491		0.00010	mg/L	20-JUN-19	20-JUN-19	R4680212
Cadmium (Cd)-Total	0.000132		0.0000050	mg/L	20-JUN-19	20-JUN-19	R4680212

* 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
L2291847-2 ARV-4 Sampled By: CLIENT on 13-JUN-19 @ 09:40 Matrix: WATER							
Total Metals in Water by CRC ICPMS							
Calcium (Ca)-Total	17.2		0.050	mg/L	20-JUN-19	20-JUN-19	R4680212
Chromium (Cr)-Total	0.00070		0.00010	mg/L	20-JUN-19	20-JUN-19	R4680212
Cobalt (Co)-Total	0.00256		0.00010	mg/L	20-JUN-19	20-JUN-19	R4680212
Copper (Cu)-Total	0.0410		0.00050	mg/L	20-JUN-19	20-JUN-19	R4680212
Iron (Fe)-Total	3.55		0.010	mg/L	20-JUN-19	20-JUN-19	R4680212
Lead (Pb)-Total	0.00175		0.000050	mg/L	20-JUN-19	20-JUN-19	R4680212
Magnesium (Mg)-Total	13.5		0.0050	mg/L	20-JUN-19	20-JUN-19	R4680212
Manganese (Mn)-Total	0.293		0.00010	mg/L	20-JUN-19	20-JUN-19	R4680212
Nickel (Ni)-Total	0.00617		0.00050	mg/L	20-JUN-19	20-JUN-19	R4680212
Potassium (K)-Total	15.8		0.050	mg/L	20-JUN-19	20-JUN-19	R4680212
Sodium (Na)-Total	97.7		0.050	mg/L	20-JUN-19	20-JUN-19	R4680212
Zinc (Zn)-Total	0.0196		0.0030	mg/L	20-JUN-19	20-JUN-19	R4680212
Total Organic Carbon by Combustion							
Total Organic Carbon	30.9		0.50	mg/L		25-JUN-19	R4688336
Total Suspended Solids							
Total Suspended Solids	15.9		2.0	mg/L		18-JUN-19	R4673730
pH							
pH	7.47		0.10	pH units		18-JUN-19	R4673671
L2291847-3 ARV-5 Sampled By: CLIENT on 13-JUN-19 @ 10:15 Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050	RRR	0.00050	mg/L		19-JUN-19	R4682726
Toluene	<0.0010	RRR	0.0010	mg/L		19-JUN-19	R4682726
Ethyl benzene	<0.00050	RRR	0.00050	mg/L		19-JUN-19	R4682726
o-Xylene	<0.00050	RRR	0.00050	mg/L		19-JUN-19	R4682726
m+p-Xylenes	<0.00040	RRR	0.00040	mg/L		19-JUN-19	R4682726
F1 (C6-C10)	<0.10	RRR	0.10	mg/L		19-JUN-19	R4682726
Surrogate: 4-Bromofluorobenzene (SS)	88.0		70-130	%		19-JUN-19	R4682726
Note: Note: Sample received with headspace. Results may be biased low.							
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	18-JUN-19	21-JUN-19	R4687788
F3 (C16-C34)	<0.25		0.25	mg/L	18-JUN-19	21-JUN-19	R4687788
F4 (C34-C50)	<0.25		0.25	mg/L	18-JUN-19	21-JUN-19	R4687788
Surrogate: 2-Bromobenzotrifluoride	108.0		60-140	%	18-JUN-19	21-JUN-19	R4687788
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		29-JUN-19	
F2-Naphth	<0.10		0.10	mg/L		29-JUN-19	
F3-PAH	<0.25		0.25	mg/L		29-JUN-19	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		29-JUN-19	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		29-JUN-19	
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
Acenaphthene	<0.000020		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
Acenaphthylene	<0.000020		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
Anthracene	<0.000010		0.000010	mg/L	19-JUN-19	25-JUN-19	R4684786
Acridine	<0.000020		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786

* 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
L2291847-3 ARV-5							
Sampled By: CLIENT on 13-JUN-19 @ 10:15							
Matrix: WATER							
Polyaromatic Hydrocarbons (PAHs)							
Benzo(a)anthracene	<0.000010		0.000010	mg/L	19-JUN-19	25-JUN-19	R4684786
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	19-JUN-19	25-JUN-19	R4684786
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	19-JUN-19	25-JUN-19	R4684786
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	19-JUN-19	25-JUN-19	R4684786
Chrysene	<0.000020		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	19-JUN-19	25-JUN-19	R4684786
Fluoranthene	<0.000020		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
Fluorene	<0.000020		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	19-JUN-19	25-JUN-19	R4684786
Naphthalene	<0.000050		0.000050	mg/L	19-JUN-19	25-JUN-19	R4684786
Phenanthrene	<0.000050		0.000050	mg/L	19-JUN-19	25-JUN-19	R4684786
Pyrene	<0.000010		0.000010	mg/L	19-JUN-19	25-JUN-19	R4684786
Quinoline	<0.000020		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	19-JUN-19	25-JUN-19	R4684786
Surrogate: Acenaphthene d10	95.5		60-130	%	19-JUN-19	25-JUN-19	R4684786
Surrogate: Acridine d9	69.7		60-130	%	19-JUN-19	25-JUN-19	R4684786
Surrogate: Chrysene d12	89.2		60-130	%	19-JUN-19	25-JUN-19	R4684786
Surrogate: Naphthalene d8	96.4		50-130	%	19-JUN-19	25-JUN-19	R4684786
Surrogate: Phenanthrene d10	95.9		60-130	%	19-JUN-19	25-JUN-19	R4684786
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO ₃)	64.7		1.2	mg/L		19-JUN-19	
Alkalinity, Carbonate							
Carbonate (CO ₃)	<0.60		0.60	mg/L		19-JUN-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		19-JUN-19	
Alkalinity, Total (as CaCO₃)							
Alkalinity, Total (as CaCO ₃)	53.0		1.0	mg/L		18-JUN-19	R4673671
Ammonia by colour							
Ammonia, Total (as N)	0.015		0.010	mg/L		19-JUN-19	R4678331
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		15-JUN-19	R4682354
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		15-JUN-19	R4682354
Chloride in Water by IC							
Chloride (Cl)	164		0.50	mg/L		14-JUN-19	R4673753
Conductivity							
Conductivity	679		1.0	umhos/cm		18-JUN-19	R4673671
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	500	MBHT	10	MPN/100mL		14-JUN-19	R4671347
Hardness Calculated							
Hardness (as CaCO ₃)	109	HTC	0.20	mg/L		21-JUN-19	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	15-JUN-19	17-JUN-19	R4672470
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		14-JUN-19	R4673753
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		19-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		14-JUN-19	R4673753
Oil & Grease - Gravimetric							

* 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
L2291847-3 ARV-5 Sampled By: CLIENT on 13-JUN-19 @ 10:15 Matrix: WATER							
Oil & Grease - Gravimetric							
Oil and Grease	10.9		5.0	mg/L		20-JUN-19	R4677328
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		18-JUN-19	R4673366
Phosphorus, Total							
Phosphorus (P)-Total	0.0290		0.0030	mg/L		18-JUN-19	R4672439
Sulfate in Water by IC							
Sulfate (SO4)	16.7		0.30	mg/L		14-JUN-19	R4673753
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0254		0.0030	mg/L	20-JUN-19	20-JUN-19	R4680212
Arsenic (As)-Total	0.00043		0.00010	mg/L	20-JUN-19	20-JUN-19	R4680212
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	20-JUN-19	20-JUN-19	R4680212
Calcium (Ca)-Total	19.4		0.050	mg/L	20-JUN-19	20-JUN-19	R4680212
Chromium (Cr)-Total	0.00025		0.00010	mg/L	20-JUN-19	20-JUN-19	R4680212
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	20-JUN-19	20-JUN-19	R4680212
Copper (Cu)-Total	0.00079		0.00050	mg/L	20-JUN-19	20-JUN-19	R4680212
Iron (Fe)-Total	0.518		0.010	mg/L	20-JUN-19	20-JUN-19	R4680212
Lead (Pb)-Total	0.000077		0.000050	mg/L	20-JUN-19	20-JUN-19	R4680212
Magnesium (Mg)-Total	14.6		0.0050	mg/L	20-JUN-19	20-JUN-19	R4680212
Manganese (Mn)-Total	0.0158		0.00010	mg/L	20-JUN-19	20-JUN-19	R4680212
Nickel (Ni)-Total	0.00057		0.00050	mg/L	20-JUN-19	20-JUN-19	R4680212
Potassium (K)-Total	6.78		0.050	mg/L	20-JUN-19	20-JUN-19	R4680212
Sodium (Na)-Total	92.1		0.050	mg/L	20-JUN-19	20-JUN-19	R4680212
Zinc (Zn)-Total	0.0050		0.0030	mg/L	20-JUN-19	20-JUN-19	R4680212
Total Organic Carbon by Combustion							
Total Organic Carbon	8.13		0.50	mg/L		25-JUN-19	R4688336
Total Suspended Solids							
Total Suspended Solids	3.6		2.0	mg/L		18-JUN-19	R4673730
pH							
pH	7.63		0.10	pH units		18-JUN-19	R4673671
L2291847-4 LAGOON Sampled By: CLIENT on 13-JUN-19 @ 09:50 Matrix: WASTE WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050	RRR	0.00050	mg/L		19-JUN-19	R4682726
Toluene	0.0650	RRR	0.0010	mg/L		19-JUN-19	R4682726
Ethyl benzene	<0.00050	RRR	0.00050	mg/L		19-JUN-19	R4682726
o-Xylene	<0.00050	RRR	0.00050	mg/L		19-JUN-19	R4682726
m+p-Xylenes	<0.00040	RRR	0.00040	mg/L		19-JUN-19	R4682726
F1 (C6-C10)	0.16	RRR	0.10	mg/L		19-JUN-19	R4682726
Surrogate: 4-Bromofluorobenzene (SS)	91.0		70-130	%		19-JUN-19	R4682726
Note: Note: Sample received with headspace. Results may be biased low.							
CCME PHC F2-F4 in Water							
F2 (C10-C16)	2.94		0.10	mg/L	18-JUN-19	21-JUN-19	R4687788
F3 (C16-C34)	19.7		0.25	mg/L	18-JUN-19	21-JUN-19	R4687788
F4 (C34-C50)	4.31		0.25	mg/L	18-JUN-19	21-JUN-19	R4687788
Surrogate: 2-Bromobenzotrifluoride	106.5		60-140	%	18-JUN-19	21-JUN-19	R4687788
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		29-JUN-19	
F2-Naphth	2.94		0.10	mg/L		29-JUN-19	
F3-PAH	19.7		0.25	mg/L		29-JUN-19	

* 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
L2291847-4 LAGOON							
Sampled By: CLIENT on 13-JUN-19 @ 09:50							
Matrix: WASTE WATER							
CCME Total Hydrocarbons							
Total Hydrocarbons (C6-C50)	27.1		0.38	mg/L		29-JUN-19	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		29-JUN-19	
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	0.000035	EMPC	0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
2-Methyl Naphthalene	0.000037		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
Acenaphthene	0.000040		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
Acenaphthylene	<0.000020		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
Anthracene	<0.000010		0.000010	mg/L	19-JUN-19	25-JUN-19	R4684786
Acridine	<0.00010	DLM	0.00010	mg/L	19-JUN-19	25-JUN-19	R4684786
Benzo(a)anthracene	<0.000010		0.000010	mg/L	19-JUN-19	25-JUN-19	R4684786
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	19-JUN-19	25-JUN-19	R4684786
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	19-JUN-19	25-JUN-19	R4684786
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
Benzo(k)fluoranthene	<0.000010	EMPC	0.000010	mg/L	19-JUN-19	25-JUN-19	R4684786
Chrysene	<0.000020		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	19-JUN-19	25-JUN-19	R4684786
Fluoranthene	<0.000020		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
Fluorene	0.000060		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
Indeno(1,2,3-cd)pyrene	<0.000010	EMPC	0.000010	mg/L	19-JUN-19	25-JUN-19	R4684786
Naphthalene	0.000099		0.000050	mg/L	19-JUN-19	25-JUN-19	R4684786
Phenanthrene	0.000082		0.000050	mg/L	19-JUN-19	25-JUN-19	R4684786
Pyrene	<0.000020		0.000020	mg/L	19-JUN-19	25-JUN-19	R4684786
Quinoline	<0.00020		0.00020	mg/L	19-JUN-19	25-JUN-19	R4684786
B(a)P Total Potency Equivalent	<0.000030	DLM	0.000030	mg/L	19-JUN-19	25-JUN-19	R4684786
Surrogate: Acenaphthene d10	119.0		60-130	%	19-JUN-19	25-JUN-19	R4684786
Surrogate: Acridine d9	96.7		60-130	%	19-JUN-19	25-JUN-19	R4684786
Surrogate: Chrysene d12	113.1		60-130	%	19-JUN-19	25-JUN-19	R4684786
Surrogate: Naphthalene d8	212.5		50-130	%	19-JUN-19	25-JUN-19	R4684786
Surrogate: Phenanthrene d10	106.3	SOL:MI	60-130	%	19-JUN-19	25-JUN-19	R4684786
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	347		1.2	mg/L		17-JUN-19	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		17-JUN-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		17-JUN-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	285		1.0	mg/L		14-JUN-19	R4671351
Ammonia by colour							
Ammonia, Total (as N)	76		10	mg/L		19-JUN-19	R4678331
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	238		50	mg/L		15-JUN-19	R4682354
Carbonaceous BOD							
BOD Carbonaceous	220		50	mg/L		15-JUN-19	R4682354
Chloride in Water by IC							
Chloride (Cl)	59.9		1.0	mg/L		14-JUN-19	R4673753
Conductivity							
Conductivity	852		1.0	umhos/cm		14-JUN-19	R4671351
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	>24200		10	MPN/100mL		14-JUN-19	R4671333

* 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
L2291847-4 LAGOON							
Sampled By: CLIENT on 13-JUN-19 @ 09:50							
Matrix: WASTE WATER							
Hardness Calculated							
Hardness (as CaCO3)	42.3	HTC	0.20	mg/L		25-JUN-19	
Mercury Total							
Mercury (Hg)-Total	<0.000010		0.000010	mg/L	15-JUN-19	17-JUN-19	R4672470
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		14-JUN-19	R4673753
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		19-JUN-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		14-JUN-19	R4673753
Oil & Grease - Gravimetric							
Oil and Grease	31.7		5.0	mg/L		20-JUN-19	R4677328
Phenol (4AAP)							
Phenols (4AAP)	0.465	DLM	0.010	mg/L		18-JUN-19	R4673366
Phosphorus, Total							
Phosphorus (P)-Total	8.99		0.030	mg/L		18-JUN-19	R4672439
Sulfate in Water by IC							
Sulfate (SO4)	8.27		0.60	mg/L		14-JUN-19	R4673753
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.234		0.0030	mg/L	24-JUN-19	24-JUN-19	R4683256
Arsenic (As)-Total	0.00069		0.00010	mg/L	24-JUN-19	24-JUN-19	R4683256
Cadmium (Cd)-Total	0.000218		0.0000050	mg/L	24-JUN-19	24-JUN-19	R4683256
Calcium (Ca)-Total	8.76		0.050	mg/L	24-JUN-19	24-JUN-19	R4683256
Chromium (Cr)-Total	0.00102		0.00010	mg/L	24-JUN-19	24-JUN-19	R4683256
Cobalt (Co)-Total	0.00057		0.00010	mg/L	24-JUN-19	24-JUN-19	R4683256
Copper (Cu)-Total	0.126		0.00050	mg/L	24-JUN-19	24-JUN-19	R4683256
Iron (Fe)-Total	0.689		0.010	mg/L	24-JUN-19	24-JUN-19	R4683256
Lead (Pb)-Total	0.00153		0.000050	mg/L	24-JUN-19	24-JUN-19	R4683256
Magnesium (Mg)-Total	4.96		0.0050	mg/L	24-JUN-19	24-JUN-19	R4683256
Manganese (Mn)-Total	0.0536		0.00010	mg/L	24-JUN-19	24-JUN-19	R4683256
Nickel (Ni)-Total	0.00274		0.00050	mg/L	24-JUN-19	24-JUN-19	R4683256
Potassium (K)-Total	22.8		0.050	mg/L	24-JUN-19	24-JUN-19	R4683256
Sodium (Na)-Total	48.9		0.050	mg/L	24-JUN-19	24-JUN-19	R4683256
Zinc (Zn)-Total	0.0954		0.0030	mg/L	24-JUN-19	24-JUN-19	R4683256
Total Organic Carbon by Combustion							
Total Organic Carbon	163		5.0	mg/L		25-JUN-19	R4688336
Total Suspended Solids							
Total Suspended Solids	41.6		6.0	mg/L		20-JUN-19	R4681118
pH							
pH	7.49		0.10	pH units		14-JUN-19	R4671351

* 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).
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).
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.
RRR	Refer to Report Remarks for issues regarding this analysis
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
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.			
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°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.			
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.

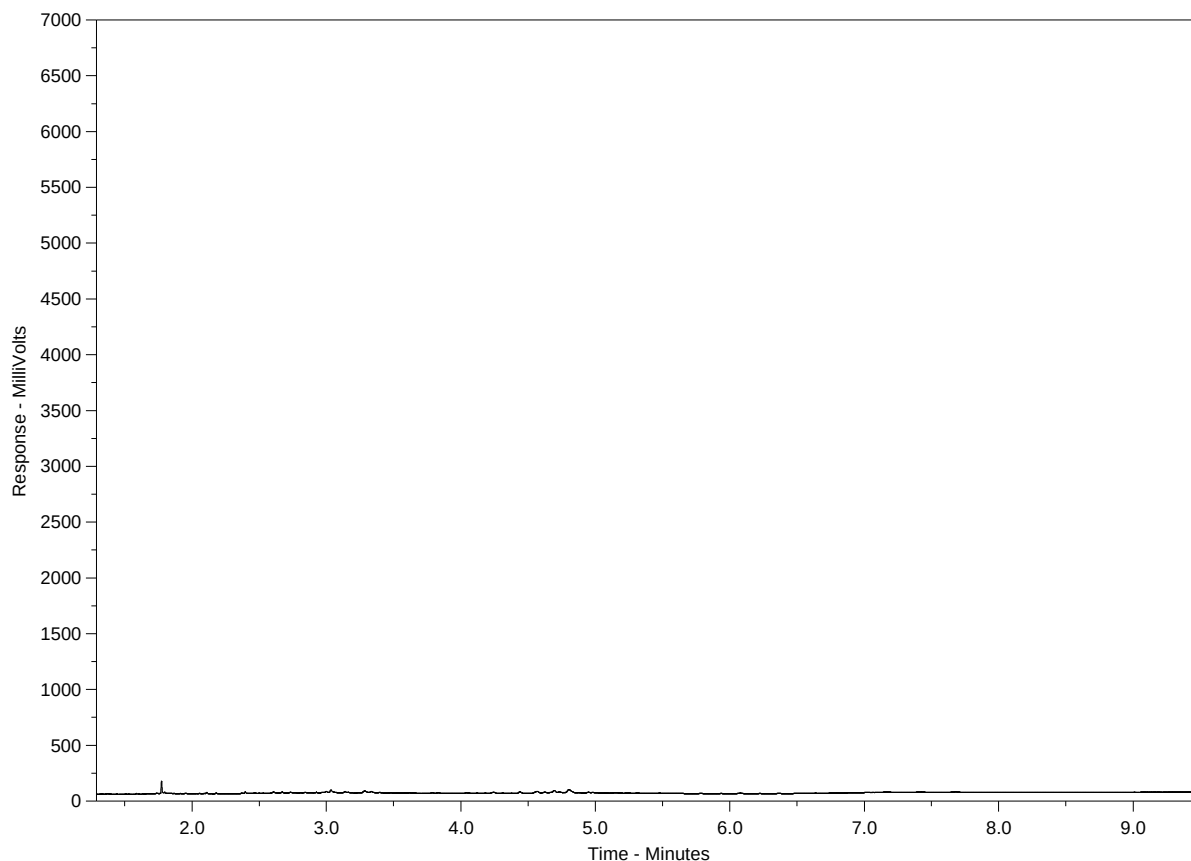
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2291847-1
Client Sample ID: ARV-2



← 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.

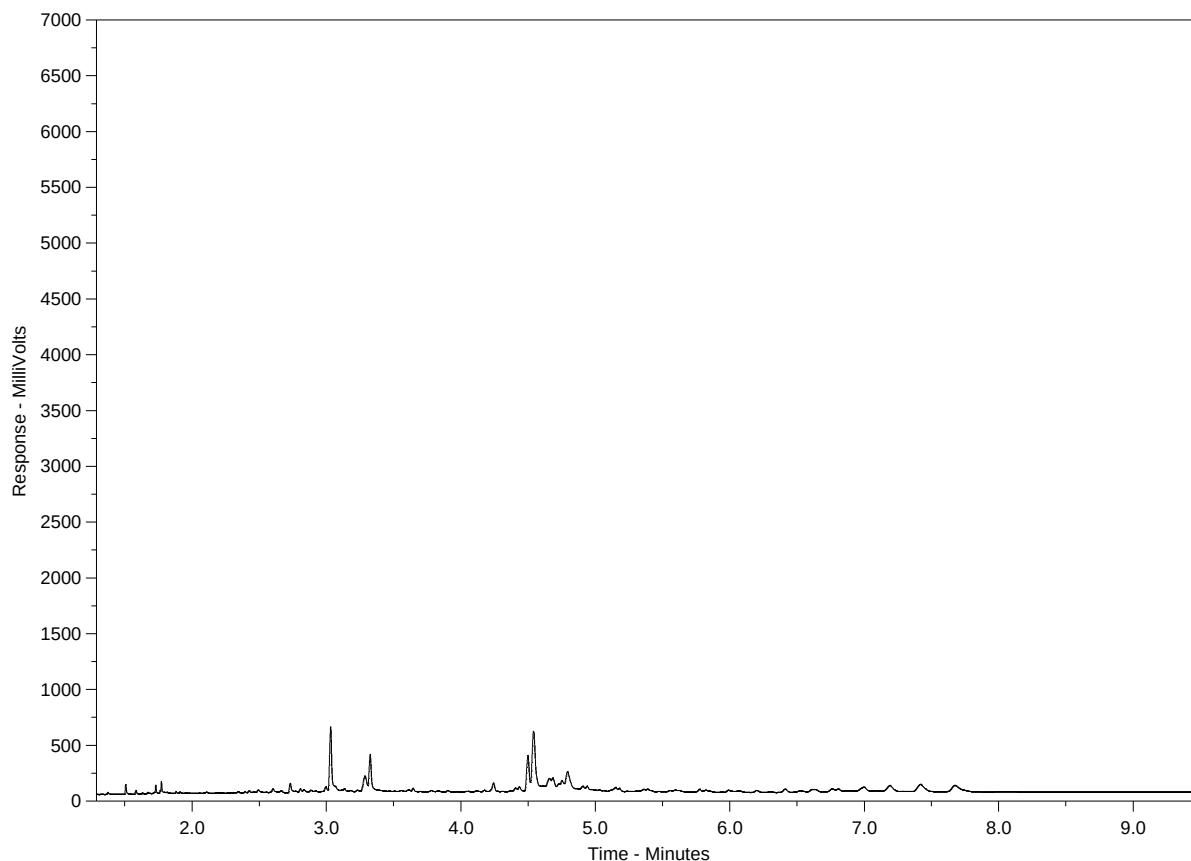
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2291847-2
Client Sample ID: ARV-4



← 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.

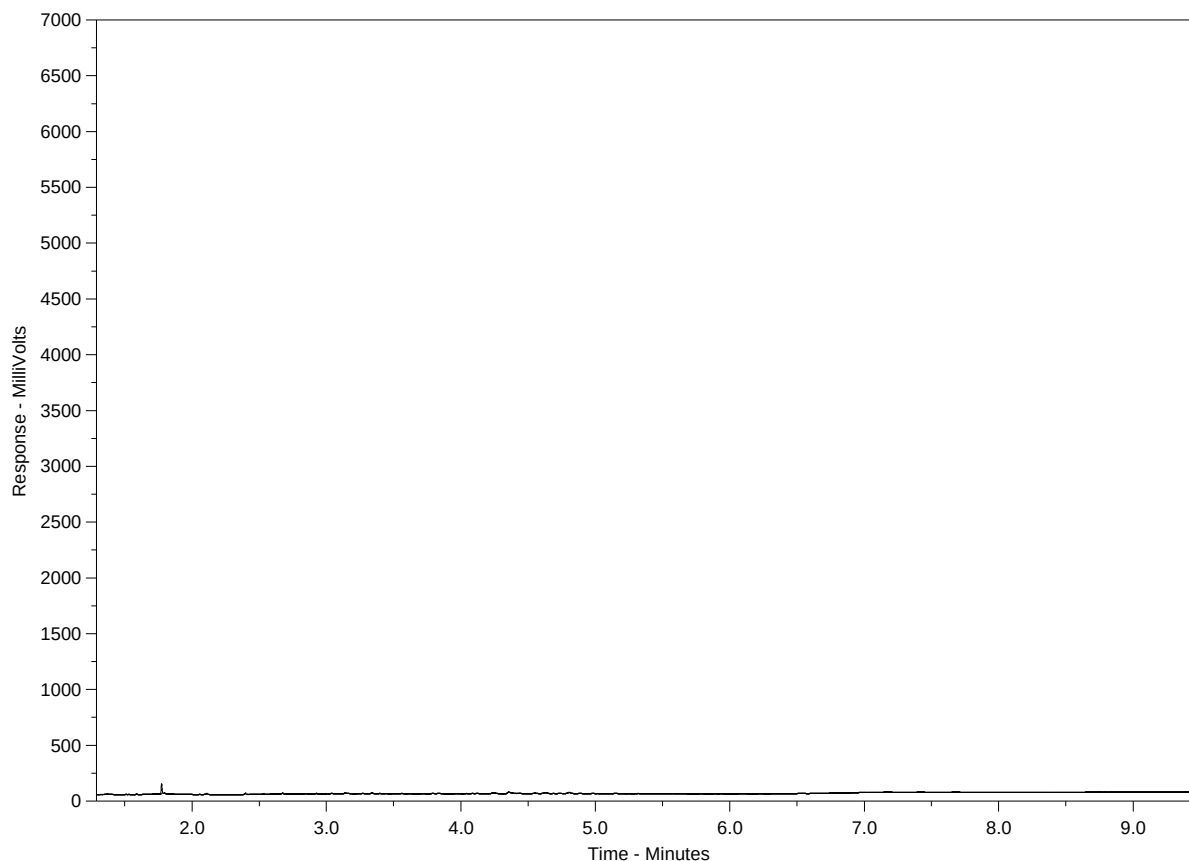
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2291847-3
Client Sample ID: ARV-5



← 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.

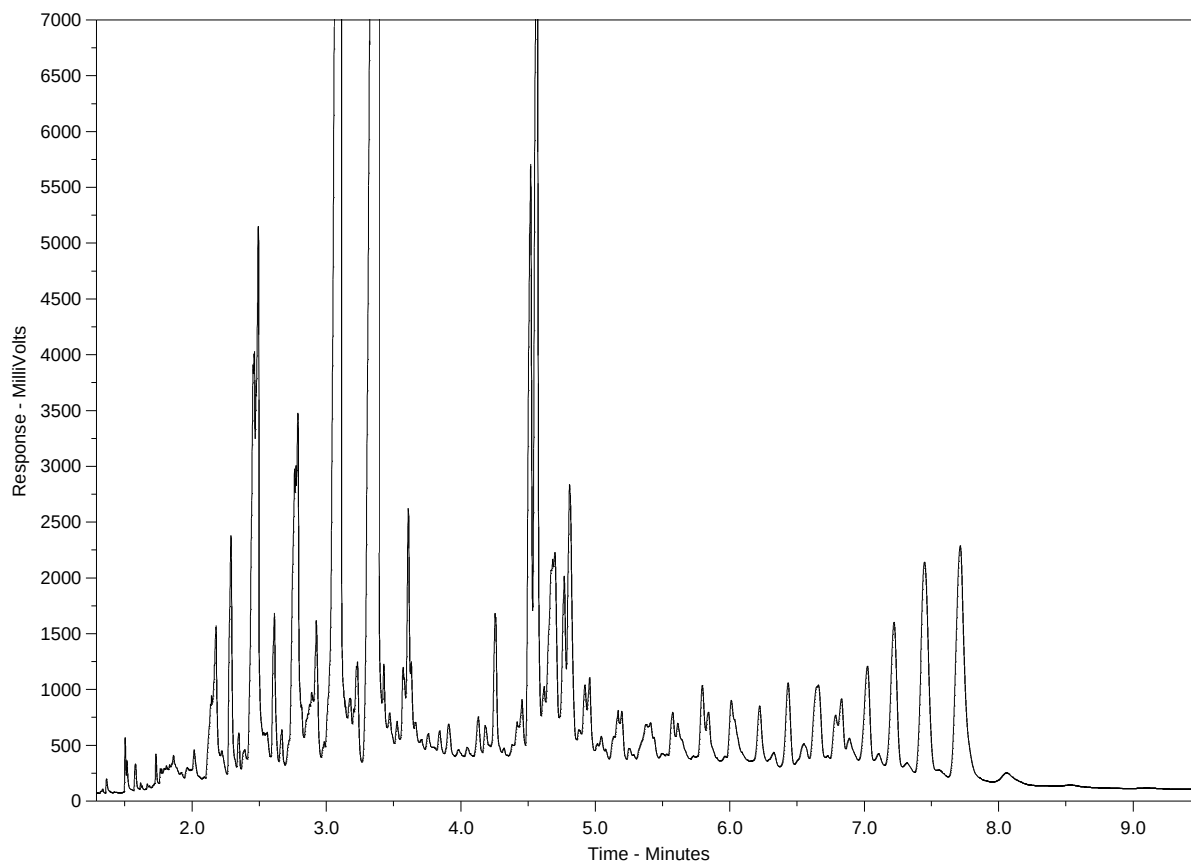
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2291847-4
Client Sample ID: LAGOON



← 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.



L2291847-COFC

COC Number: 14 - 50

Page 1 of 1

Report To		Report Format		Below (Rush Turnaround Time (TAT) is not available for all tests)																																																																							
Company: <u>Hamlet of ARVIAT</u>		Select Report Format: ☐ PDF ☐ EXCEL ☐ EDD (DIGITAL)		R ☐ Regular (Standard TAT if received by 3pm)																																																																							
Contact: <u>Steve England</u>		Quality Control (QC) Report with Report ☐ Yes ☐ No		P ☐ Priority (2-4 business days if received by 3pm)																																																																							
Address: <u>Box 150</u> <u>ARVIAT, NU X0C-0E0</u>		☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 business days if received by 3pm)																																																																							
Phone: <u>867-857-2841</u>		Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX		E2 ☐ Same day or weekend emergency if received by 10am - contact ALS for surcharge.																																																																							
Email 1 or Fax: <u>arviat.sco@arviat.ca</u>		Email 2: <u>scollins@arviat.ca</u>		Specify Date Required for E2, E or P:																																																																							
Invoice To		Invoice Distribution		Analysis Request																																																																							
Same as Report To ☒ Yes ☐ No		Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																																																							
Copy of Invoice with Report ☐ Yes ☒ No		Email 1 or Fax		<table border="1"> <tr> <td>Nitrients</td> <td>Oil & Grease</td> <td>PAH/EPH/F2-P4</td> <td>PAH/EPH/F2-P4</td> <td>Sulfuric Acid</td> <td>Hydrochloric Acid</td> <td>Nitric Acid</td> <td>Bacteria</td> <td>BTEX/VOC x3</td> <td>Routine:</td> <td>R.O.C</td> <td>EPH/EPH/HEPA</td> <td>F2-E4</td> <td>PATIS</td> </tr> <tr> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> </tr> <tr> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> </tr> <tr> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> </tr> <tr> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> <td>Water</td> </tr> </table>		Nitrients	Oil & Grease	PAH/EPH/F2-P4	PAH/EPH/F2-P4	Sulfuric Acid	Hydrochloric Acid	Nitric Acid	Bacteria	BTEX/VOC x3	Routine:	R.O.C	EPH/EPH/HEPA	F2-E4	PATIS	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Nitrients	Oil & Grease	PAH/EPH/F2-P4	PAH/EPH/F2-P4			Sulfuric Acid	Hydrochloric Acid	Nitric Acid	Bacteria	BTEX/VOC x3	Routine:	R.O.C	EPH/EPH/HEPA	F2-E4	PATIS																																																												
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Job #:		GL Account:		Routing Code:																																																																							
PO / AFE:		Activity Code:																																																																									
LSD:		Location:																																																																									
ALS Lab Work Order # (lab use only)		ALS Contact:		Sampler:																																																																							
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type																																																																							
	ARV-2	13/06/19	10:20	Water																																																																							
	ARV-4	13/06/19	9:40	Water																																																																							
	ARV-5	13/06/19	10:15	Water																																																																							
	ARV-6	13/06/19	9:50	Water																																																																							
	LAGOON																																																																										
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report (client use)		SAMPLE CONDITION AS RECEIVED (lab use only)																																																																							
Are samples taken from a Regulated DW System? ☐ Yes ☐ No				Frozen ☐ SIF Observations Yes ☒ No ☐																																																																							
Are samples for human drinking water use? ☐ Yes ☐ No				Ice packs Yes ☐ No ☐ Custody seal intact Yes ☐ No ☐																																																																							
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SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)		FINAL SHIPMENT RECEPTION (lab use only)																																																																							
Released by: <u>Lawe</u> Date: <u>June 13/19</u> Time: <u>10:35</u>		Received by: <u>JH</u> Date: <u>June 14</u> Time: <u>12:30</u>		Received by: _____ Date: _____ Time: _____																																																																							

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA #1-0026e v09 Printed January 2018

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

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



Hamlet of Arviat
ATTN: PAULIE ISSUMATARJUAK/STEVE
ENGLAND
PO Box 150
Arviat NU X0C 0E0

Date Received: 18-JUL-19
Report Date: 07-AUG-19 13:37 (MT)
Version: FINAL

Client Phone: 867-857-2841

Certificate of Analysis

Lab Work Order #: L2312534
Project P.O. #: NOT SUBMITTED
Job Reference: HAMLET OF ARVIAT
C of C Numbers:
Legal Site Desc:

Comments: NOTE: Frac -4 ARV-6 No 40 ml Mercury vial was received by inorganics lab - unable to analyze.

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

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2312534-1 ARV-2							
Sampled By: CLIENT on 17-JUL-19 @ 09:00							
Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		19-JUL-19	R4729929
Toluene	<0.0010		0.0010	mg/L		19-JUL-19	R4729929
Ethyl benzene	<0.00050		0.00050	mg/L		19-JUL-19	R4729929
o-Xylene	<0.00050		0.00050	mg/L		19-JUL-19	R4729929
m+p-Xylenes	<0.00040		0.00040	mg/L		19-JUL-19	R4729929
F1 (C6-C10)	<0.10		0.10	mg/L		19-JUL-19	R4729929
Surrogate: 4-Bromofluorobenzene (SS)	85.0		70-130	%		19-JUL-19	R4729929
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	19-JUL-19	20-JUL-19	R4699009
F3 (C16-C34)	<0.25		0.25	mg/L	19-JUL-19	20-JUL-19	R4699009
F4 (C34-C50)	<0.25		0.25	mg/L	19-JUL-19	20-JUL-19	R4699009
Surrogate: 2-Bromobenzotrifluoride	122.1		60-140	%	19-JUL-19	20-JUL-19	R4699009
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		31-JUL-19	
F2-Naphth	<0.10		0.10	mg/L		31-JUL-19	
F3-PAH	<0.25		0.25	mg/L		31-JUL-19	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		31-JUL-19	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		31-JUL-19	
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Acenaphthene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Acenaphthylene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Anthracene	<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Acridine	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Benzo(a)anthracene	<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	19-JUL-19	23-JUL-19	R4727407
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Chrysene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	19-JUL-19	23-JUL-19	R4727407
Fluoranthene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Fluorene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Naphthalene	<0.000050		0.000050	mg/L	19-JUL-19	23-JUL-19	R4727407
Phenanthrene	<0.000050		0.000050	mg/L	19-JUL-19	23-JUL-19	R4727407
Pyrene	<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Quinoline	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	19-JUL-19	23-JUL-19	R4727407
Surrogate: Acenaphthene d10	79.5		60-130	%	19-JUL-19	23-JUL-19	R4727407
Surrogate: Acridine d9	86.0		60-130	%	19-JUL-19	23-JUL-19	R4727407
Surrogate: Chrysene d12	95.0		60-130	%	19-JUL-19	23-JUL-19	R4727407
Surrogate: Naphthalene d8	78.6		50-130	%	19-JUL-19	23-JUL-19	R4727407
Surrogate: Phenanthrene d10	86.0		60-130	%	19-JUL-19	23-JUL-19	R4727407
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	537		1.2	mg/L		22-JUL-19	
Alkalinity, Carbonate							

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

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2312534-1 ARV-2							
Sampled By: CLIENT on 17-JUL-19 @ 09:00							
Matrix: WATER							
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		22-JUL-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		22-JUL-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	440		1.0	mg/L		19-JUL-19	R4719748
Ammonia by colour							
Ammonia, Total (as N)	4.72		0.10	mg/L		22-JUL-19	R4721003
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	31.5		6.0	mg/L		19-JUL-19	R4727945
Carbonaceous BOD							
BOD Carbonaceous	16.6		6.0	mg/L		19-JUL-19	R4727945
Chloride in Water by IC							
Chloride (Cl)	49		10	mg/L		19-JUL-19	R4722635
Conductivity							
Conductivity	2930		1.0	umhos/cm		19-JUL-19	R4719748
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	60	MBHT	10	MPN/100mL		18-JUL-19	R4715857
Hardness Calculated							
Hardness (as CaCO3)	841	HTC	0.20	mg/L		29-JUL-19	
Mercury Total							
Mercury (Hg)-Total	0.0000190		0.0000050	mg/L	30-JUL-19	30-JUL-19	R4731130
Nitrate in Water by IC							
Nitrate (as N)	<0.40	DLM	0.40	mg/L		19-JUL-19	R4722635
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.45		0.45	mg/L		24-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.20	DLM	0.20	mg/L		19-JUL-19	R4722635
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		23-JUL-19	R4720809
Phenol (4AAP)							
Phenols (4AAP)	0.0056		0.0010	mg/L		19-JUL-19	R4719699
Phosphorus, Total							
Phosphorus (P)-Total	0.411		0.0030	mg/L		22-JUL-19	R4720390
Sulfate in Water by IC							
Sulfate (SO4)	81.5		6.0	mg/L		19-JUL-19	R4722635
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0228		0.0030	mg/L	26-JUL-19	26-JUL-19	R4728936
Arsenic (As)-Total	0.00490		0.00010	mg/L	26-JUL-19	26-JUL-19	R4728936
Cadmium (Cd)-Total	0.000179		0.0000050	mg/L	26-JUL-19	26-JUL-19	R4728936
Calcium (Ca)-Total	232		0.050	mg/L	26-JUL-19	26-JUL-19	R4728936
Chromium (Cr)-Total	0.00142		0.00010	mg/L	26-JUL-19	26-JUL-19	R4728936
Cobalt (Co)-Total	0.00183		0.00010	mg/L	26-JUL-19	26-JUL-19	R4728936
Copper (Cu)-Total	0.0269		0.00050	mg/L	26-JUL-19	26-JUL-19	R4728936
Iron (Fe)-Total	1.29		0.010	mg/L	26-JUL-19	26-JUL-19	R4728936
Lead (Pb)-Total	0.00329		0.000050	mg/L	26-JUL-19	26-JUL-19	R4728936
Magnesium (Mg)-Total	63.7		0.0050	mg/L	26-JUL-19	26-JUL-19	R4728936
Manganese (Mn)-Total	0.794		0.00010	mg/L	26-JUL-19	26-JUL-19	R4728936
Nickel (Ni)-Total	0.00854		0.00050	mg/L	26-JUL-19	26-JUL-19	R4728936
Potassium (K)-Total	53.8		0.050	mg/L	26-JUL-19	26-JUL-19	R4728936
Sodium (Na)-Total	284		0.050	mg/L	26-JUL-19	26-JUL-19	R4728936
Zinc (Zn)-Total	0.109		0.0030	mg/L	26-JUL-19	26-JUL-19	R4728936
Total Organic Carbon by Combustion							

* 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
L2312534-1	ARV-2							
Sampled By: CLIENT on 17-JUL-19 @ 09:00								
Matrix: WATER								
Total Organic Carbon by Combustion								
Total Organic Carbon		48.1		0.50	mg/L		22-JUL-19	R4720568
Total Suspended Solids								
Total Suspended Solids		25.1		2.0	mg/L		24-JUL-19	R4724375
pH								
pH		8.09		0.10	pH units		19-JUL-19	R4719748
L2312534-2	ARV-4							
Sampled By: CLIENT on 17-JUL-19 @ 08:44								
Matrix: WATER								
BTEX plus F1-F4								
BTX plus F1 by GCMS								
Benzene		<0.00050		0.00050	mg/L		19-JUL-19	R4729929
Toluene		0.0173		0.0010	mg/L		19-JUL-19	R4729929
Ethyl benzene		<0.00050		0.00050	mg/L		19-JUL-19	R4729929
o-Xylene		<0.00050		0.00050	mg/L		19-JUL-19	R4729929
m+p-Xylenes		<0.00040		0.00040	mg/L		19-JUL-19	R4729929
F1 (C6-C10)		<0.10		0.10	mg/L		19-JUL-19	R4729929
Surrogate: 4-Bromofluorobenzene (SS)		87.0		70-130	%		19-JUL-19	R4729929
CCME PHC F2-F4 in Water								
F2 (C10-C16)		0.61		0.10	mg/L	19-JUL-19	20-JUL-19	R4699009
F3 (C16-C34)		6.46		0.25	mg/L	19-JUL-19	20-JUL-19	R4699009
F4 (C34-C50)		1.62		0.25	mg/L	19-JUL-19	20-JUL-19	R4699009
Surrogate: 2-Bromobenzotrifluoride		126.6		60-140	%	19-JUL-19	20-JUL-19	R4699009
CCME Total Hydrocarbons								
F1-BTEX		<0.10		0.10	mg/L		31-JUL-19	
F2-Naphth		0.61		0.10	mg/L		31-JUL-19	
F3-PAH		6.46		0.25	mg/L		31-JUL-19	
Total Hydrocarbons (C6-C50)		8.69		0.38	mg/L		31-JUL-19	
Sum of Xylene Isomer Concentrations								
Xylenes (Total)		<0.00064		0.00064	mg/L		31-JUL-19	
Polyaromatic Hydrocarbons (PAHs)								
1-Methyl Naphthalene		<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
2-Methyl Naphthalene		<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Acenaphthene		<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Acenaphthylene		<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Anthracene		<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Acridine		0.000091		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Benzo(a)anthracene		<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Benzo(a)pyrene		<0.0000050		0.0000050	mg/L	19-JUL-19	23-JUL-19	R4727407
Benzo(b&j)fluoranthene		<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Benzo(g,h,i)perylene		<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Benzo(k)fluoranthene		<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Chrysene		<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Dibenzo(a,h)anthracene		<0.0000050		0.0000050	mg/L	19-JUL-19	23-JUL-19	R4727407
Fluoranthene		<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Fluorene		0.000033	EMPC	0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Indeno(1,2,3-cd)pyrene		<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Naphthalene		<0.000050		0.000050	mg/L	19-JUL-19	23-JUL-19	R4727407
Phenanthrene		<0.000050		0.000050	mg/L	19-JUL-19	23-JUL-19	R4727407
Pyrene		<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Quinoline		0.000072		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407

* 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
L2312534-2 ARV-4							
Sampled By: CLIENT on 17-JUL-19 @ 08:44							
Matrix: WATER							
Polyaromatic Hydrocarbons (PAHs)							
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	19-JUL-19	23-JUL-19	R4727407
Surrogate: Acenaphthene d10	101.6		60-130	%	19-JUL-19	23-JUL-19	R4727407
Surrogate: Acridine d9	101.5		60-130	%	19-JUL-19	23-JUL-19	R4727407
Surrogate: Chrysene d12	116.8		60-130	%	19-JUL-19	23-JUL-19	R4727407
Surrogate: Naphthalene d8	110.4		50-130	%	19-JUL-19	23-JUL-19	R4727407
Surrogate: Phenanthrene d10	101.7		60-130	%	19-JUL-19	23-JUL-19	R4727407
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	340		1.2	mg/L		22-JUL-19	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		22-JUL-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		22-JUL-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	279		1.0	mg/L		19-JUL-19	R4719748
Ammonia by colour							
Ammonia, Total (as N)	65.9		2.0	mg/L		23-JUL-19	R4723915
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	65		20	mg/L		19-JUL-19	R4727945
Carbonaceous BOD							
BOD Carbonaceous	58		20	mg/L		19-JUL-19	R4727945
Chloride in Water by IC							
Chloride (Cl)	73.8		0.50	mg/L		19-JUL-19	R4722635
Conductivity							
Conductivity	856		1.0	umhos/cm		19-JUL-19	R4719748
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	>24200	MBHT	10	MPN/100mL		18-JUL-19	R4715857
Hardness Calculated							
Hardness (as CaCO3)	58.0	HTC	0.20	mg/L		29-JUL-19	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	23-JUL-19	23-JUL-19	R4723870
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		19-JUL-19	R4722635
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		24-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		19-JUL-19	R4722635
Oil & Grease - Gravimetric							
Oil and Grease	11.7		5.0	mg/L		23-JUL-19	R4720809
Phenol (4AAP)							
Phenols (4AAP)	0.197	DLM	0.010	mg/L		22-JUL-19	R4719897
Phosphorus, Total							
Phosphorus (P)-Total	9.46		0.030	mg/L		22-JUL-19	R4720390
Sulfate in Water by IC							
Sulfate (SO4)	3.54		0.30	mg/L		19-JUL-19	R4722635
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.148		0.0030	mg/L	26-JUL-19	26-JUL-19	R4728936
Arsenic (As)-Total	0.00420		0.00010	mg/L	26-JUL-19	26-JUL-19	R4728936
Cadmium (Cd)-Total	0.0000898		0.0000050	mg/L	26-JUL-19	26-JUL-19	R4728936
Calcium (Ca)-Total	13.6		0.050	mg/L	26-JUL-19	26-JUL-19	R4728936
Chromium (Cr)-Total	0.00108		0.00010	mg/L	26-JUL-19	26-JUL-19	R4728936
Cobalt (Co)-Total	0.00172		0.00010	mg/L	26-JUL-19	26-JUL-19	R4728936

* 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
L2312534-2 ARV-4 Sampled By: CLIENT on 17-JUL-19 @ 08:44 Matrix: WATER Total Metals in Water by CRC ICPMS Copper (Cu)-Total 0.0753 0.00050 mg/L 26-JUL-19 26-JUL-19 R4728936 Iron (Fe)-Total 2.61 0.010 mg/L 26-JUL-19 26-JUL-19 R4728936 Lead (Pb)-Total 0.00213 0.000050 mg/L 26-JUL-19 26-JUL-19 R4728936 Magnesium (Mg)-Total 5.84 0.0050 mg/L 26-JUL-19 26-JUL-19 R4728936 Manganese (Mn)-Total 0.206 0.00010 mg/L 26-JUL-19 26-JUL-19 R4728936 Nickel (Ni)-Total 0.00622 0.00050 mg/L 26-JUL-19 26-JUL-19 R4728936 Potassium (K)-Total 22.6 0.050 mg/L 26-JUL-19 26-JUL-19 R4728936 Sodium (Na)-Total 55.6 0.050 mg/L 26-JUL-19 26-JUL-19 R4728936 Zinc (Zn)-Total 0.0681 0.0030 mg/L 26-JUL-19 26-JUL-19 R4728936 Total Organic Carbon by Combustion Total Organic Carbon 88.7 5.0 mg/L 23-JUL-19 R4722928 Total Suspended Solids Total Suspended Solids 45.8 3.0 mg/L 24-JUL-19 R4724375 pH pH 7.66 0.10 pH units 19-JUL-19 R4719748							
L2312534-3 ARV-5 Sampled By: CLIENT on 17-JUL-19 @ 09:14 Matrix: WATER BTEX plus F1-F4 BTX plus F1 by GCMS Benzene <0.00050 0.00050 mg/L 19-JUL-19 R4729929 Toluene <0.0010 0.0010 mg/L 19-JUL-19 R4729929 Ethyl benzene <0.00050 0.00050 mg/L 19-JUL-19 R4729929 o-Xylene <0.00050 0.00050 mg/L 19-JUL-19 R4729929 m+p-Xylenes <0.00040 0.00040 mg/L 19-JUL-19 R4729929 F1 (C6-C10) <0.10 0.10 mg/L 19-JUL-19 R4729929 Surrogate: 4-Bromofluorobenzene (SS) 89.0 70-130 % 19-JUL-19 R4729929 CCME PHC F2-F4 in Water F2 (C10-C16) <0.10 0.10 mg/L 19-JUL-19 20-JUL-19 R4699009 F3 (C16-C34) <0.25 0.25 mg/L 19-JUL-19 20-JUL-19 R4699009 F4 (C34-C50) <0.25 0.25 mg/L 19-JUL-19 20-JUL-19 R4699009 Surrogate: 2-Bromobenzotrifluoride 120.5 60-140 % 19-JUL-19 20-JUL-19 R4699009 CCME Total Hydrocarbons F1-BTEX <0.10 0.10 mg/L 31-JUL-19 F2-Naphth <0.10 0.10 mg/L 31-JUL-19 F3-PAH <0.25 0.25 mg/L 31-JUL-19 Total Hydrocarbons (C6-C50) <0.38 0.38 mg/L 31-JUL-19 Sum of Xylene Isomer Concentrations Xylenes (Total) <0.00064 0.00064 mg/L 31-JUL-19 Polyaromatic Hydrocarbons (PAHs) 1-Methyl Naphthalene <0.000020 0.000020 mg/L 19-JUL-19 23-JUL-19 R4727407 2-Methyl Naphthalene <0.000020 0.000020 mg/L 19-JUL-19 23-JUL-19 R4727407 Acenaphthene <0.000020 0.000020 mg/L 19-JUL-19 23-JUL-19 R4727407 Acenaphthylene <0.000020 0.000020 mg/L 19-JUL-19 23-JUL-19 R4727407 Anthracene <0.000010 0.000010 mg/L 19-JUL-19 23-JUL-19 R4727407 Acridine <0.000020 0.000020 mg/L 19-JUL-19 23-JUL-19 R4727407 Benzo(a)anthracene <0.000010 0.000010 mg/L 19-JUL-19 23-JUL-19 R4727407 Benzo(a)pyrene <0.0000050 0.0000050 mg/L 19-JUL-19 23-JUL-19 R4727407 Benzo(b&j)fluoranthene <0.000010 0.000010 mg/L 19-JUL-19 23-JUL-19 R4727407 Benzo(g,h,i)perylene <0.000020 0.000020 mg/L 19-JUL-19 23-JUL-19 R4727407							

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

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2312534-3 ARV-5							
Sampled By: CLIENT on 17-JUL-19 @ 09:14							
Matrix: WATER							
Polyaromatic Hydrocarbons (PAHs)							
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Chrysene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	19-JUL-19	23-JUL-19	R4727407
Fluoranthene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Fluorene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Naphthalene	<0.000050		0.000050	mg/L	19-JUL-19	23-JUL-19	R4727407
Phenanthrene	<0.000050		0.000050	mg/L	19-JUL-19	23-JUL-19	R4727407
Pyrene	<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Quinoline	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	19-JUL-19	23-JUL-19	R4727407
Surrogate: Acenaphthene d10	82.9		60-130	%	19-JUL-19	23-JUL-19	R4727407
Surrogate: Acridine d9	88.2		60-130	%	19-JUL-19	23-JUL-19	R4727407
Surrogate: Chrysene d12	97.5		60-130	%	19-JUL-19	23-JUL-19	R4727407
Surrogate: Naphthalene d8	79.9		50-130	%	19-JUL-19	23-JUL-19	R4727407
Surrogate: Phenanthrene d10	86.3		60-130	%	19-JUL-19	23-JUL-19	R4727407
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	92.2		1.2	mg/L		22-JUL-19	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		22-JUL-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		22-JUL-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	75.6		1.0	mg/L		19-JUL-19	R4719748
Ammonia by colour							
Ammonia, Total (as N)	0.057		0.010	mg/L		22-JUL-19	R4721003
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		19-JUL-19	R4727945
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		19-JUL-19	R4727945
Chloride in Water by IC							
Chloride (Cl)	200		0.50	mg/L		19-JUL-19	R4722635
Conductivity							
Conductivity	834		1.0	umhos/cm		19-JUL-19	R4719748
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	MBHT	10	MPN/100mL		18-JUL-19	R4715857
Hardness Calculated							
Hardness (as CaCO3)	133	HTC	0.20	mg/L		29-JUL-19	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	30-JUL-19	30-JUL-19	R4731130
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		19-JUL-19	R4722635
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		24-JUL-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		19-JUL-19	R4722635
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		23-JUL-19	R4720809
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		22-JUL-19	R4719897
Phosphorus, Total							

* 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
L2312534-3	ARV-5							
Sampled By: CLIENT on 17-JUL-19 @ 09:14								
Matrix: WATER								
Phosphorus, Total								
Phosphorus (P)-Total		0.0353		0.0030	mg/L		22-JUL-19	R4720390
Sulfate in Water by IC								
Sulfate (SO4)		10.9		0.30	mg/L		19-JUL-19	R4722635
Total Metals in Water by CRC ICPMS								
Aluminum (Al)-Total		0.0260		0.0030	mg/L	26-JUL-19	26-JUL-19	R4728936
Arsenic (As)-Total		0.00062		0.00010	mg/L	26-JUL-19	26-JUL-19	R4728936
Cadmium (Cd)-Total		0.0000093		0.0000050	mg/L	26-JUL-19	26-JUL-19	R4728936
Calcium (Ca)-Total		24.5		0.050	mg/L	26-JUL-19	26-JUL-19	R4728936
Chromium (Cr)-Total		0.00030		0.00010	mg/L	26-JUL-19	26-JUL-19	R4728936
Cobalt (Co)-Total		0.00015		0.00010	mg/L	26-JUL-19	26-JUL-19	R4728936
Copper (Cu)-Total		0.00074		0.00050	mg/L	26-JUL-19	26-JUL-19	R4728936
Iron (Fe)-Total		1.14		0.010	mg/L	26-JUL-19	26-JUL-19	R4728936
Lead (Pb)-Total		0.000057		0.000050	mg/L	26-JUL-19	26-JUL-19	R4728936
Magnesium (Mg)-Total		17.5		0.0050	mg/L	26-JUL-19	26-JUL-19	R4728936
Manganese (Mn)-Total		0.0662		0.00010	mg/L	26-JUL-19	26-JUL-19	R4728936
Nickel (Ni)-Total		0.00052		0.00050	mg/L	26-JUL-19	26-JUL-19	R4728936
Potassium (K)-Total		6.48		0.050	mg/L	26-JUL-19	26-JUL-19	R4728936
Sodium (Na)-Total		106		0.050	mg/L	26-JUL-19	26-JUL-19	R4728936
Zinc (Zn)-Total		0.0079		0.0030	mg/L	26-JUL-19	26-JUL-19	R4728936
Total Organic Carbon by Combustion								
Total Organic Carbon		10.4		0.50	mg/L		22-JUL-19	R4720568
Total Suspended Solids								
Total Suspended Solids		6.7		2.0	mg/L		24-JUL-19	R4724375
pH								
pH		7.80		0.10	pH units		19-JUL-19	R4719748
L2312534-4	ARV-6							
Sampled By: CLIENT on 17-JUL-19 @ 09:27								
Matrix: WATER								
BTEX plus F1-F4								
BTX plus F1 by GCMS								
Benzene		<0.00050		0.00050	mg/L		19-JUL-19	R4729929
Toluene		0.0011		0.0010	mg/L		19-JUL-19	R4729929
Ethyl benzene		<0.00050		0.00050	mg/L		19-JUL-19	R4729929
o-Xylene		<0.00050		0.00050	mg/L		19-JUL-19	R4729929
m+p-Xylenes		<0.00040		0.00040	mg/L		19-JUL-19	R4729929
F1 (C6-C10)		<0.10		0.10	mg/L		19-JUL-19	R4729929
Surrogate: 4-Bromofluorobenzene (SS)		82.0		70-130	%		19-JUL-19	R4729929
CCME PHC F2-F4 in Water								
F2 (C10-C16)		0.12		0.10	mg/L	19-JUL-19	20-JUL-19	R4699009
F3 (C16-C34)		<0.25		0.25	mg/L	19-JUL-19	20-JUL-19	R4699009
F4 (C34-C50)		<0.25		0.25	mg/L	19-JUL-19	20-JUL-19	R4699009
Surrogate: 2-Bromobenzotrifluoride		113.3		60-140	%	19-JUL-19	20-JUL-19	R4699009
CCME Total Hydrocarbons								
F1-BTEX		<0.10		0.10	mg/L		31-JUL-19	
F2-Naphth		0.12		0.10	mg/L		31-JUL-19	
F3-PAH		<0.25		0.25	mg/L		31-JUL-19	
Total Hydrocarbons (C6-C50)		<0.38		0.38	mg/L		31-JUL-19	
Sum of Xylene Isomer Concentrations								
Xylenes (Total)		<0.00064		0.00064	mg/L		31-JUL-19	
Miscellaneous Parameters								
Mercury (Hg)-Total		<0.0000050		0.0000050	mg/L	01-AUG-19	07-AUG-19	R4742665

* 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
L2312534-4 ARV-6							
Sampled By: CLIENT on 17-JUL-19 @ 09:27							
Matrix: WATER							
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	0.000028		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Acenaphthene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Acenaphthylene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Anthracene	<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Acridine	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Benzo(a)anthracene	<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	19-JUL-19	23-JUL-19	R4727407
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Chrysene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	19-JUL-19	23-JUL-19	R4727407
Fluoranthene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Fluorene	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Naphthalene	<0.000050		0.000050	mg/L	19-JUL-19	23-JUL-19	R4727407
Phenanthrene	<0.000050		0.000050	mg/L	19-JUL-19	23-JUL-19	R4727407
Pyrene	<0.000010		0.000010	mg/L	19-JUL-19	23-JUL-19	R4727407
Quinoline	<0.000020		0.000020	mg/L	19-JUL-19	23-JUL-19	R4727407
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	19-JUL-19	23-JUL-19	R4727407
Surrogate: Acenaphthene d10	81.0		60-130	%	19-JUL-19	23-JUL-19	R4727407
Surrogate: Acridine d9	91.4		60-130	%	19-JUL-19	23-JUL-19	R4727407
Surrogate: Chrysene d12	95.9		60-130	%	19-JUL-19	23-JUL-19	R4727407
Surrogate: Naphthalene d8	82.9		50-130	%	19-JUL-19	23-JUL-19	R4727407
Surrogate: Phenanthrene d10	87.5		60-130	%	19-JUL-19	23-JUL-19	R4727407
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	127		1.2	mg/L		22-JUL-19	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		22-JUL-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		22-JUL-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	104		1.0	mg/L		19-JUL-19	R4719748
Ammonia by colour							
Ammonia, Total (as N)	0.100		0.010	mg/L		22-JUL-19	R4721003
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<6.0		6.0	mg/L		19-JUL-19	R4727945
Carbonaceous BOD							
BOD Carbonaceous	<6.0		6.0	mg/L		19-JUL-19	R4727945
Chloride in Water by IC							
Chloride (Cl)	130		0.50	mg/L		19-JUL-19	R4722635
Conductivity							
Conductivity	630		1.0	umhos/cm		19-JUL-19	R4719748
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10	MBHT	10	MPN/100mL		18-JUL-19	R4715857
Hardness Calculated							
Hardness (as CaCO3)	164	HTC	0.20	mg/L		30-JUL-19	
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		19-JUL-19	R4722635
Nitrate+Nitrite							

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

Sample Details/Parameters		Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2312534-4	ARV-6							
Sampled By:	CLIENT on 17-JUL-19 @ 09:27							
Matrix:	WATER							
Nitrate+Nitrite								
Nitrate and Nitrite as N		<0.070		0.070	mg/L		24-JUL-19	
Nitrite in Water by IC								
Nitrite (as N)		<0.010		0.010	mg/L		19-JUL-19	R4722635
Oil & Grease - Gravimetric								
Oil and Grease		<5.0		5.0	mg/L		23-JUL-19	R4720809
Phenol (4AAP)								
Phenols (4AAP)		0.0034		0.0010	mg/L		19-JUL-19	R4719699
Phosphorus, Total								
Phosphorus (P)-Total		0.0560		0.0030	mg/L		22-JUL-19	R4720390
Sulfate in Water by IC								
Sulfate (SO4)		2.68		0.30	mg/L		19-JUL-19	R4722635
Total Metals in Water by CRC ICPMS								
Aluminum (Al)-Total		0.0339		0.0030	mg/L	26-JUL-19	26-JUL-19	R4728936
Arsenic (As)-Total		0.00100		0.00010	mg/L	26-JUL-19	26-JUL-19	R4728936
Cadmium (Cd)-Total		0.0000712		0.0000050	mg/L	26-JUL-19	26-JUL-19	R4728936
Calcium (Ca)-Total		44.8		0.050	mg/L	26-JUL-19	26-JUL-19	R4728936
Chromium (Cr)-Total		0.00044		0.00010	mg/L	26-JUL-19	26-JUL-19	R4728936
Cobalt (Co)-Total		0.00212		0.00010	mg/L	26-JUL-19	26-JUL-19	R4728936
Copper (Cu)-Total		0.00087		0.00050	mg/L	26-JUL-19	26-JUL-19	R4728936
Iron (Fe)-Total		11.1		0.010	mg/L	26-JUL-19	26-JUL-19	R4728936
Lead (Pb)-Total		0.000082		0.000050	mg/L	26-JUL-19	26-JUL-19	R4728936
Magnesium (Mg)-Total		12.7		0.0050	mg/L	26-JUL-19	26-JUL-19	R4728936
Manganese (Mn)-Total		2.27		0.010	mg/L	26-JUL-19	29-JUL-19	R4730604
Nickel (Ni)-Total		0.00141		0.00050	mg/L	26-JUL-19	26-JUL-19	R4728936
Potassium (K)-Total		6.41		0.050	mg/L	26-JUL-19	26-JUL-19	R4728936
Sodium (Na)-Total		43.0		0.050	mg/L	26-JUL-19	26-JUL-19	R4728936
Zinc (Zn)-Total		0.0183		0.0030	mg/L	26-JUL-19	26-JUL-19	R4728936
Total Organic Carbon by Combustion								
Total Organic Carbon		11.0		0.50	mg/L		22-JUL-19	R4720568
Total Suspended Solids								
Total Suspended Solids		30.7		2.0	mg/L		24-JUL-19	R4724375
pH								
pH		7.63		0.10	pH units		19-JUL-19	R4719748

* 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).
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).
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-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.			
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.			
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,			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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°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 CaCO ₃ 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.			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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:

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.

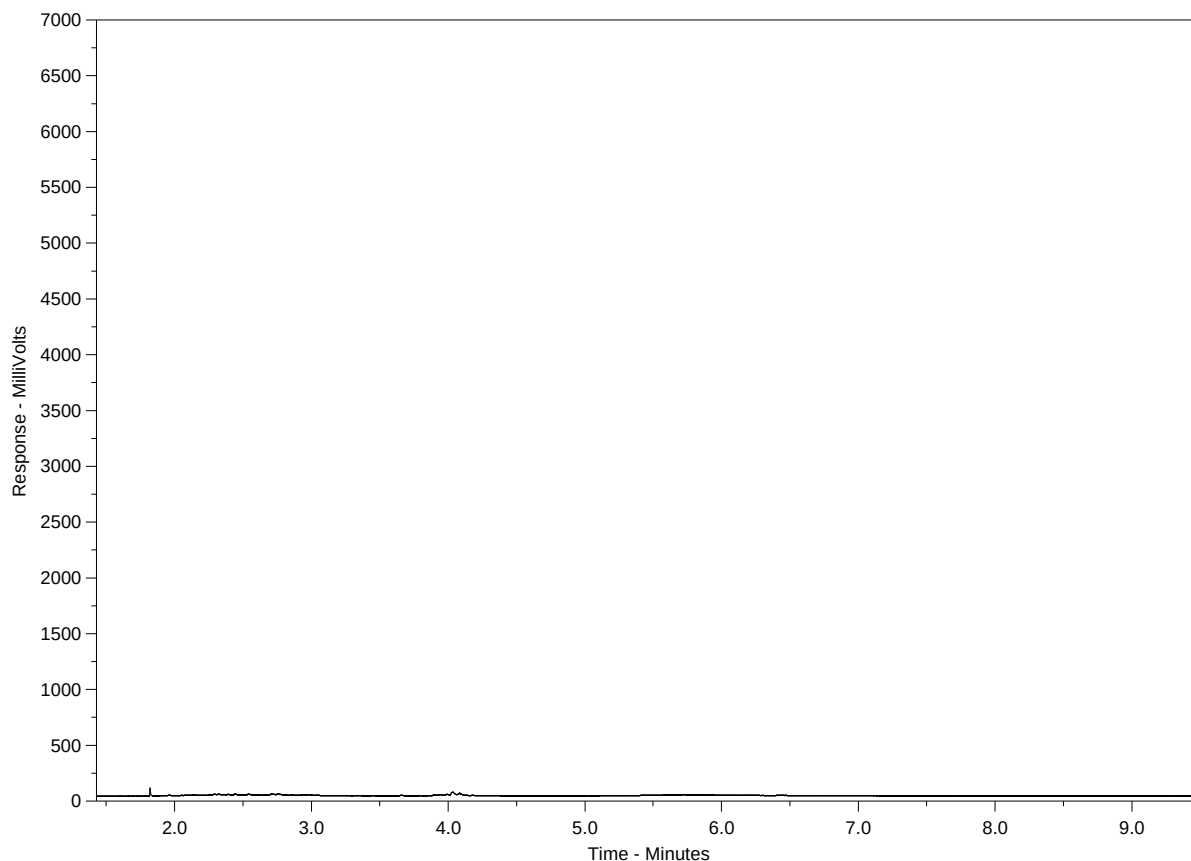
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2312534-1
Client Sample ID: ARV-2



← 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.

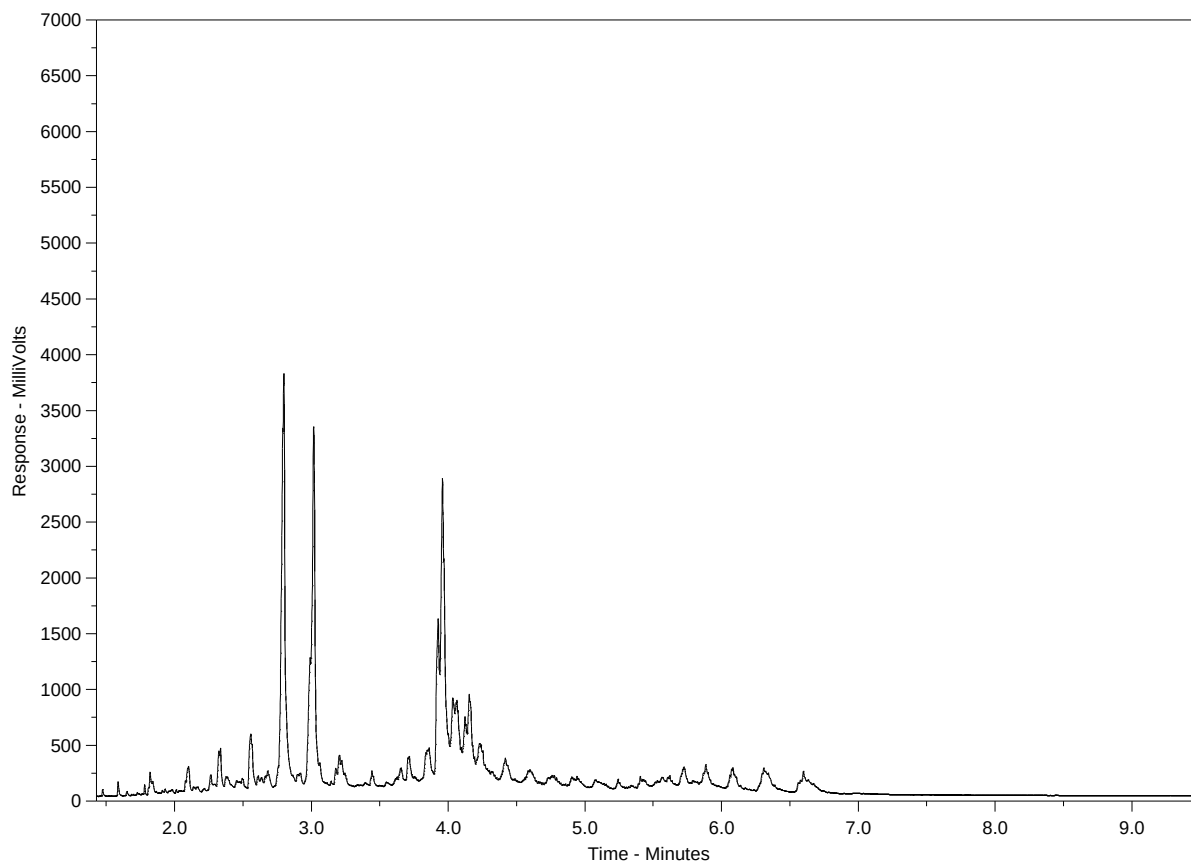
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2312534-2
Client Sample ID: ARV-4



← 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.

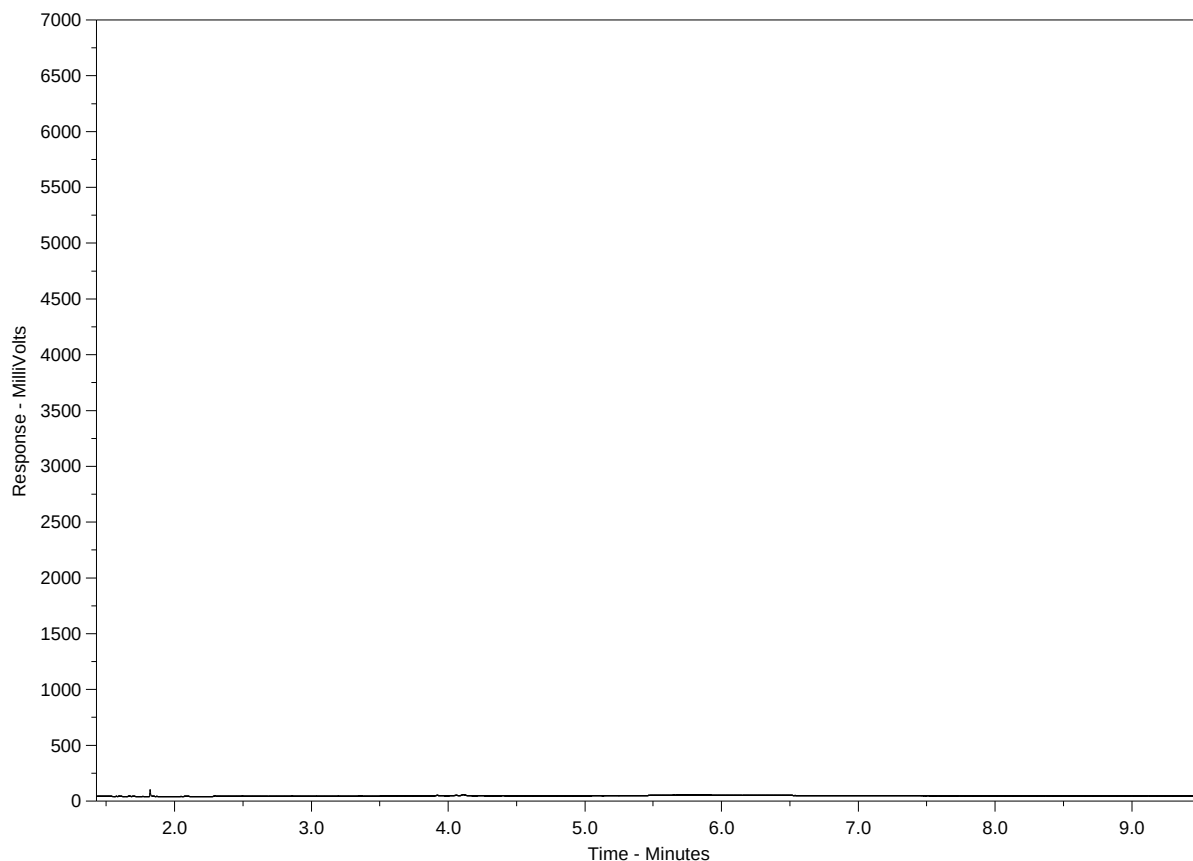
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2312534-3
Client Sample ID: ARV-5



← 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.

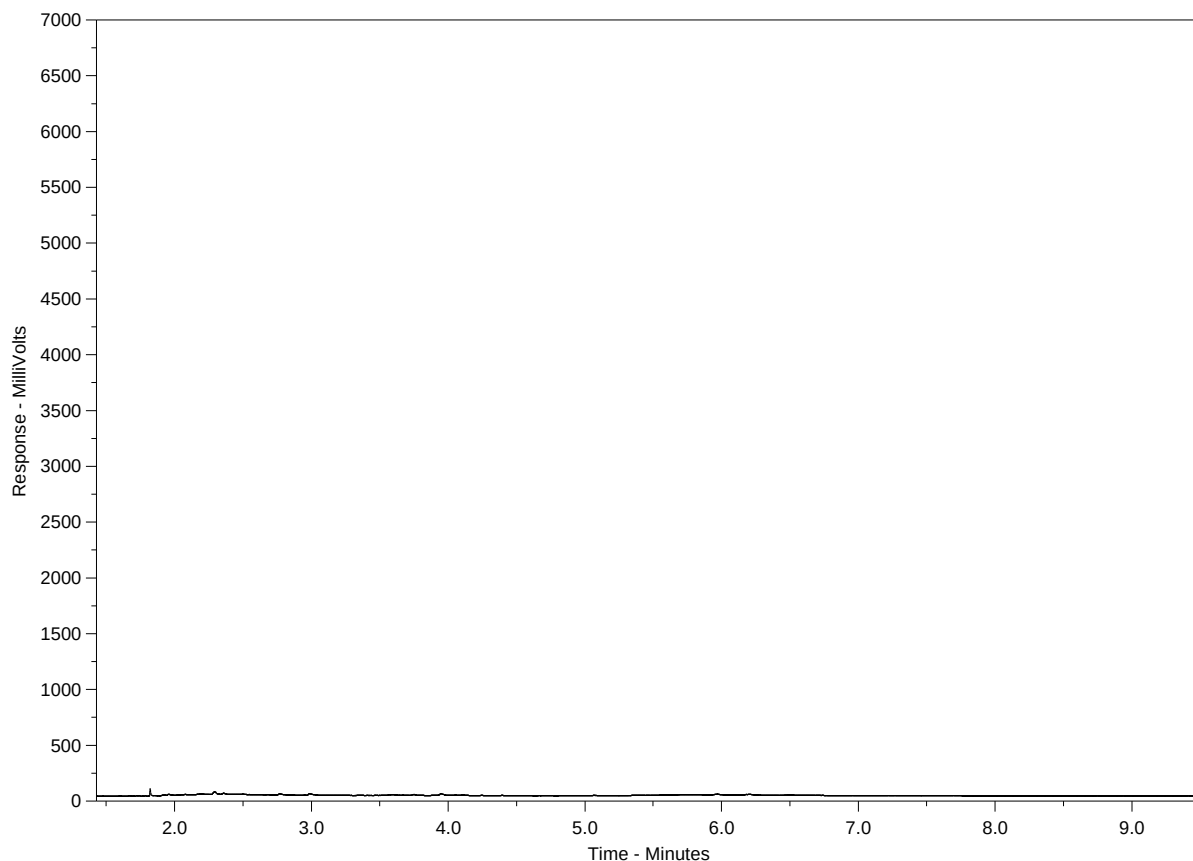
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2312534-4
Client Sample ID: ARV-6



← 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.



Chain of Custody (COC) / Analytical
Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com



COC Number: 17 - 747858

Page of

Report To		Report Format / Distribution		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)	
Company:	Hamlet of Arviat	Select Report Format:	☐ PDF ☐ EXCEL ☐ EDD (DIGITAL)	Regular [R]	☐ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Steve England	Quality Control (QC) Report with Report	☐ YES ☐ NO	4 day [P4-20%]	☐ 1 Business day [E - 100%]
Phone:	867-851-2841	☐ Compare Results to Criteria on Report - provide details below if box checked		3 day [P3-25%]	☐ Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)]
Company address below will appear on the final report		Select Distribution:	☐ EMAIL ☐ MAIL ☐ FAX	2 day [P2-50%]	☐
Street:		Email 1 or Fax	arvats@arviat.ca	Date and Time Required for all E&P TATs: dd-mm-yy hh:mm	
City/Province:	ARVIAT, N4	Email 2	scollins@gov.nu.ca	For tests that can not be performed according to the service level selected, you will be contacted.	
Postal Code:	X0C-0E0	Email 3		Analysis Request	
Invoice To	Same as Report To ☒ YES ☐ NO	Invoice Distribution		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below	
Copy of Invoice with Report	☐ YES ☒ NO	Select Invoice Distribution:	☐ EMAIL ☐ MAIL ☐ FAX		
Company:		Email 1 or Fax			
Contact:		Email 2			
Project Information		Oil and Gas Required Fields (client use)			
ALS Account # / Quote #:		AFE/Cost Center:	PO#		
Job #:		Major/Minor Code:	Routing Code:		
PO / AFE:		Requisitioner:			
LSD:		Location:			
ALS Lab Work Order # (lab use only):		ALS Contact:	Sampler:		
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	
	ARV-2	171016	9:00am	Nutrients	
	ARV-4	171016	8:44am	D.O. & Grease	
	ARV-5	171016	9:14am	PAH/EPH/F2-P4	
	ARV-6	171016	9:27am	PAH/EPH/F2-P4	
				Sulfuric Acid	
				Hydrochloric Acid	
				Bacteria	
				BTEX/VOC x 3	
				Routine	
				ROC	
				EPH/EPH/MEPH	
				PAHs	
Drinking Water (DW) Samples (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)		SAMPLE CONDITION AS RECEIVED (lab use only)	
Are samples taken from a Regulated DW System?				Frozen ☐ SIF Observations ☒ Yes ☐ No ☐	
Are samples for human consumption/ use?				Ice Packs ☒ Ice Cubes ☐ Custody seal intact ☒ Yes ☐ No ☐	
				Cooling Initiated ☒	
				INITIAL COOLER TEMPERATURES °C 19.4 FINAL COOLER TEMPERATURES °C	
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)		FINAL SHIPMENT RECEPTION (lab use only)	
Released by:	Date:	Received by:	Date:	Received by:	Date:
			JUL 18 2019		JUL 18 2019

SAMPLES ON HOLD

SUSPECTED HAZARD (see Special Instructions)



Hamlet of Arviat
ATTN: STEVE ENGLAND
PO Box 150
Arviat NU X0C 0E0

Date Received: 29-AUG-19
Report Date: 16-SEP-19 13:52 (MT)
Version: FINAL

Client Phone: 867-857-2841

Certificate of Analysis

Lab Work Order #: L2338359
Project P.O. #: NOT SUBMITTED
Job Reference: HAMLET OF ARVIAT
C of C Numbers:
Legal Site Desc:

Craig Riddell, B.Sc.Ag
Account 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
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2338359-1 ARV-2							
Sampled By: CLIENT on 26-AUG-19 @ 09:35							
Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050	RRR	0.00050	mg/L		04-SEP-19	R4794128
Toluene	<0.0010	RRR	0.0010	mg/L		04-SEP-19	R4794128
Ethyl benzene	<0.00050	RRR	0.00050	mg/L		04-SEP-19	R4794128
o-Xylene	<0.00050	RRR	0.00050	mg/L		04-SEP-19	R4794128
m+p-Xylenes	0.00068	RRR	0.00040	mg/L		04-SEP-19	R4794128
F1 (C6-C10)	<0.10	RRR	0.10	mg/L		04-SEP-19	R4794128
Surrogate: 4-Bromofluorobenzene (SS)	87.0		70-130	%		04-SEP-19	R4794128
Note: Sample submitted with headspace. Results may be biased low.							
CCME PHC F2-F4 in Water							
F2 (C10-C16)	0.16		0.10	mg/L	30-AUG-19	30-AUG-19	R4778053
F3 (C16-C34)	<0.25		0.25	mg/L	30-AUG-19	30-AUG-19	R4778053
F4 (C34-C50)	<0.25		0.25	mg/L	30-AUG-19	30-AUG-19	R4778053
Surrogate: 2-Bromobenzotrifluoride	91.5		60-140	%	30-AUG-19	30-AUG-19	R4778053
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		11-SEP-19	
F2-Naphth	0.16		0.10	mg/L		11-SEP-19	
F3-PAH	<0.25		0.25	mg/L		11-SEP-19	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		11-SEP-19	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	0.00068		0.00064	mg/L		11-SEP-19	
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	0.000040		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
2-Methyl Naphthalene	0.000047		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Acenaphthene	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Acenaphthylene	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Anthracene	<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Acridine	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(a)anthracene	<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Chrysene	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	31-AUG-19	06-SEP-19	R4789969
Fluoranthene	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Fluorene	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Naphthalene	0.000057	EMPC	0.000050	mg/L	31-AUG-19	06-SEP-19	R4789969
Phenanthrene	<0.000050		0.000050	mg/L	31-AUG-19	06-SEP-19	R4789969
Pyrene	<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Quinoline	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	31-AUG-19	06-SEP-19	R4789969
Surrogate: Acenaphthene d10	90.4		60-130	%	31-AUG-19	06-SEP-19	R4789969
Surrogate: Acridine d9	105.2		60-130	%	31-AUG-19	06-SEP-19	R4789969
Surrogate: Chrysene d12	98.8		60-130	%	31-AUG-19	06-SEP-19	R4789969
Surrogate: Naphthalene d8	99.3		50-130	%	31-AUG-19	06-SEP-19	R4789969
Surrogate: Phenanthrene d10	105.2		60-130	%	31-AUG-19	06-SEP-19	R4789969
Nunavut WW Group 1							
Alkalinity, Bicarbonate							

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

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2338359-1 ARV-2							
Sampled By: CLIENT on 26-AUG-19 @ 09:35							
Matrix: WATER							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	699		1.2	mg/L		03-SEP-19	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		03-SEP-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		03-SEP-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	573		1.0	mg/L		30-AUG-19	R4780896
Ammonia by colour							
Ammonia, Total (as N)	0.484		0.010	mg/L		05-SEP-19	R4786151
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	13.6		6.0	mg/L		29-AUG-19	R4782960
Carbonaceous BOD							
BOD Carbonaceous	9.6		2.0	mg/L		29-AUG-19	R4782960
Chloride in Water by IC							
Chloride (Cl)	317		0.50	mg/L		29-AUG-19	R4777992
Conductivity							
Conductivity	2910		1.0	umhos/cm		30-AUG-19	R4780896
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	360	PEHR	10	MPN/100mL		29-AUG-19	R4778251
Hardness Calculated							
Hardness (as CaCO3)	1030	HTC	0.20	mg/L		16-SEP-19	
Mercury Total							
Mercury (Hg)-Total	0.0000150		0.0000050	mg/L	29-AUG-19	09-SEP-19	R4792194
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		29-AUG-19	R4777992
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		04-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		29-AUG-19	R4777992
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		05-SEP-19	R4783734
Phenol (4AAP)							
Phenols (4AAP)	0.0367		0.0010	mg/L		03-SEP-19	R4782475
Phosphorus, Total							
Phosphorus (P)-Total	0.587		0.0030	mg/L		03-SEP-19	R4781470
Sulfate in Water by IC							
Sulfate (SO4)	669		0.30	mg/L		29-AUG-19	R4777992
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0193		0.0030	mg/L	05-SEP-19	05-SEP-19	R4784989
Arsenic (As)-Total	0.00473		0.00010	mg/L	05-SEP-19	05-SEP-19	R4784989
Cadmium (Cd)-Total	0.000223		0.0000050	mg/L	05-SEP-19	05-SEP-19	R4784989
Calcium (Ca)-Total	312		0.050	mg/L	05-SEP-19	05-SEP-19	R4784989
Chromium (Cr)-Total	0.00096		0.00010	mg/L	05-SEP-19	05-SEP-19	R4784989
Cobalt (Co)-Total	0.00138		0.00010	mg/L	05-SEP-19	05-SEP-19	R4784989
Copper (Cu)-Total	0.171		0.00050	mg/L	05-SEP-19	05-SEP-19	R4784989
Iron (Fe)-Total	1.75		0.010	mg/L	05-SEP-19	05-SEP-19	R4784989
Lead (Pb)-Total	0.00510		0.000050	mg/L	05-SEP-19	05-SEP-19	R4784989
Magnesium (Mg)-Total	60.1		0.0050	mg/L	05-SEP-19	05-SEP-19	R4784989
Manganese (Mn)-Total	1.29		0.0010	mg/L	05-SEP-19	13-SEP-19	R4808849
Nickel (Ni)-Total	0.0102		0.00050	mg/L	05-SEP-19	05-SEP-19	R4784989
Potassium (K)-Total	57.9		0.050	mg/L	05-SEP-19	05-SEP-19	R4784989
Sodium (Na)-Total	238		0.050	mg/L	05-SEP-19	05-SEP-19	R4784989

* 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
L2338359-1	ARV-2							
Sampled By: CLIENT on 26-AUG-19 @ 09:35								
Matrix: WATER								
Total Metals in Water by CRC ICPMS								
Zinc (Zn)-Total		0.184		0.0030	mg/L	05-SEP-19	05-SEP-19	R4784989
Total Organic Carbon by Combustion								
Total Organic Carbon		43.9		0.50	mg/L		06-SEP-19	R4788854
Total Suspended Solids								
Total Suspended Solids		11.9		2.0	mg/L		30-AUG-19	R4781190
pH								
pH		8.04		0.10	pH units		30-AUG-19	R4780896
L2338359-2	ARV-4							
Sampled By: CLIENT on 26-AUG-19 @ 09:15								
Matrix: WATER								
BTEX plus F1-F4								
BTX plus F1 by GCMS								
Benzene		<0.00050	RRR	0.00050	mg/L		04-SEP-19	R4794128
Toluene		<0.0010	RRR	0.0010	mg/L		04-SEP-19	R4794128
Ethyl benzene		<0.00050	RRR	0.00050	mg/L		04-SEP-19	R4794128
o-Xylene		<0.00050	RRR	0.00050	mg/L		04-SEP-19	R4794128
m+p-Xylenes		<0.00040	RRR	0.00040	mg/L		04-SEP-19	R4794128
F1 (C6-C10)		<0.10	RRR	0.10	mg/L		04-SEP-19	R4794128
Surrogate: 4-Bromofluorobenzene (SS)		85.0		70-130	%		04-SEP-19	R4794128
Note: Sample submitted with headspace. Results may be biased low.								
CCME PHC F2-F4 in Water								
F2 (C10-C16)		<0.10		0.10	mg/L	30-AUG-19	30-AUG-19	R4778053
F3 (C16-C34)		0.95		0.25	mg/L	30-AUG-19	30-AUG-19	R4778053
F4 (C34-C50)		0.28		0.25	mg/L	30-AUG-19	30-AUG-19	R4778053
Surrogate: 2-Bromobenzotrifluoride		98.2		60-140	%	30-AUG-19	30-AUG-19	R4778053
CCME Total Hydrocarbons								
F1-BTEX		<0.10		0.10	mg/L		11-SEP-19	
F2-Naphth		<0.10		0.10	mg/L		11-SEP-19	
F3-PAH		0.95		0.25	mg/L		11-SEP-19	
Total Hydrocarbons (C6-C50)		1.23		0.38	mg/L		11-SEP-19	
Sum of Xylene Isomer Concentrations								
Xylenes (Total)		<0.00064		0.00064	mg/L		11-SEP-19	
Polyaromatic Hydrocarbons (PAHs)								
1-Methyl Naphthalene		<0.000040	DLM	0.000040	mg/L	31-AUG-19	06-SEP-19	R4789969
2-Methyl Naphthalene		<0.000040	DLM	0.000040	mg/L	31-AUG-19	06-SEP-19	R4789969
Acenaphthene		<0.000040	DLM	0.000040	mg/L	31-AUG-19	06-SEP-19	R4789969
Acenaphthylene		<0.000040	DLM	0.000040	mg/L	31-AUG-19	06-SEP-19	R4789969
Anthracene		<0.000020	DLM	0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Acridine		<0.000040	DLM	0.000040	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(a)anthracene		<0.000020	DLM	0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(a)pyrene		<0.000010	DLM	0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(b&j)fluoranthene		<0.000020	DLM	0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(g,h,i)perylene		<0.000040	DLM	0.000040	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(k)fluoranthene		<0.000020	DLM	0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Chrysene		<0.000040	DLM	0.000040	mg/L	31-AUG-19	06-SEP-19	R4789969
Dibenzo(a,h)anthracene		<0.000010	DLM	0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Fluoranthene		<0.000040	DLM	0.000040	mg/L	31-AUG-19	06-SEP-19	R4789969
Fluorene		<0.000040	DLM	0.000040	mg/L	31-AUG-19	06-SEP-19	R4789969
Indeno(1,2,3-cd)pyrene		<0.000020	DLM	0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Naphthalene		<0.00010	DLM	0.00010	mg/L	31-AUG-19	06-SEP-19	R

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

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2338359-2 ARV-4							
Sampled By: CLIENT on 26-AUG-19 @ 09:15							
Matrix: WATER							
Polyaromatic Hydrocarbons (PAHs)							
Phenanthrene	<0.00010	DLM	0.00010	mg/L	31-AUG-19	06-SEP-19	R4789969
Pyrene	<0.000020	DLM	0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Quinoline	<0.00010	DLM	0.00010	mg/L	31-AUG-19	06-SEP-19	R4789969
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	31-AUG-19	06-SEP-19	R4789969
Surrogate: Acenaphthene d10	66.7		60-130	%	31-AUG-19	06-SEP-19	R4789969
Surrogate: Acridine d9	69.9		60-130	%	31-AUG-19	06-SEP-19	R4789969
Surrogate: Chrysene d12	78.4		60-130	%	31-AUG-19	06-SEP-19	R4789969
Surrogate: Naphthalene d8	67.2		50-130	%	31-AUG-19	06-SEP-19	R4789969
Surrogate: Phenanthrene d10	75.4		60-130	%	31-AUG-19	06-SEP-19	R4789969
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	208		1.2	mg/L		03-SEP-19	
Alkalinity, Carbonate							
Carbonate (CO3)	2.76		0.60	mg/L		03-SEP-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		03-SEP-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	175		1.0	mg/L		30-AUG-19	R4780896
Ammonia by colour							
Ammonia, Total (as N)	28.0		1.0	mg/L		09-SEP-19	R4795431
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	27.1		6.0	mg/L		29-AUG-19	R4782960
Carbonaceous BOD							
BOD Carbonaceous	18.2		6.0	mg/L		29-AUG-19	R4782960
Chloride in Water by IC							
Chloride (Cl)	84.9		0.50	mg/L		29-AUG-19	R4777992
Conductivity							
Conductivity	647		1.0	umhos/cm		30-AUG-19	R4780896
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	5790	PEHR	10	MPN/100mL		29-AUG-19	R4778251
Hardness Calculated							
Hardness (as CaCO3)	54.6	HTC	0.20	mg/L		06-SEP-19	
Mercury Total							
Mercury (Hg)-Total	0.0000050		0.0000050	mg/L	29-AUG-19	09-SEP-19	R4792194
Nitrate in Water by IC							
Nitrate (as N)	0.372		0.020	mg/L		29-AUG-19	R4777992
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.548		0.070	mg/L		04-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	0.176		0.010	mg/L		29-AUG-19	R4777992
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		05-SEP-19	R4783734
Phenol (4AAP)							
Phenols (4AAP)	<0.010	DLM	0.010	mg/L		30-AUG-19	R4781839
Phosphorus, Total							
Phosphorus (P)-Total	6.18		0.030	mg/L		03-SEP-19	R4781470
Sulfate in Water by IC							
Sulfate (SO4)	10.2		0.30	mg/L		29-AUG-19	R4777992
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.119		0.0030	mg/L	05-SEP-19	05-SEP-19	R4784989
Arsenic (As)-Total	0.00585		0.00010	mg/L	05-SEP-19	05-SEP-19	R4784989
Cadmium (Cd)-Total	0.0000653		0.0000050	mg/L	05-SEP-19	05-SEP-19	R4784989

* 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
L2338359-2	ARV-4							
Sampled By: CLIENT on 26-AUG-19 @ 09:15								
Matrix: WATER								
Total Metals in Water by CRC ICPMS								
Calcium (Ca)-Total		10.8		0.050	mg/L	05-SEP-19	05-SEP-19	R4784989
Chromium (Cr)-Total		0.00111		0.00010	mg/L	05-SEP-19	05-SEP-19	R4784989
Cobalt (Co)-Total		0.00123		0.00010	mg/L	05-SEP-19	05-SEP-19	R4784989
Copper (Cu)-Total		0.0368		0.00050	mg/L	05-SEP-19	05-SEP-19	R4784989
Iron (Fe)-Total		2.09		0.010	mg/L	05-SEP-19	05-SEP-19	R4784989
Lead (Pb)-Total		0.00163		0.000050	mg/L	05-SEP-19	05-SEP-19	R4784989
Magnesium (Mg)-Total		6.73		0.0050	mg/L	05-SEP-19	05-SEP-19	R4784989
Manganese (Mn)-Total		0.182		0.00010	mg/L	05-SEP-19	05-SEP-19	R4784989
Nickel (Ni)-Total		0.00557		0.00050	mg/L	05-SEP-19	05-SEP-19	R4784989
Potassium (K)-Total		18.6		0.050	mg/L	05-SEP-19	05-SEP-19	R4784989
Sodium (Na)-Total		67.6		0.050	mg/L	05-SEP-19	05-SEP-19	R4784989
Zinc (Zn)-Total		0.0233		0.0030	mg/L	05-SEP-19	05-SEP-19	R4784989
Total Organic Carbon by Combustion								
Total Organic Carbon		59.8		2.5	mg/L		06-SEP-19	R4788854
Total Suspended Solids								
Total Suspended Solids		138		2.7	mg/L		30-AUG-19	R4781190
pH								
pH		8.34		0.10	pH units		30-AUG-19	R4780896
L2338359-3	ARV-5							
Sampled By: CLIENT on 26-AUG-19 @ 09:00								
Matrix: WATER								
BTEX plus F1-F4								
BTX plus F1 by GCMS								
Benzene		<0.00050		0.00050	mg/L		04-SEP-19	R4794128
Toluene		<0.0010		0.0010	mg/L		04-SEP-19	R4794128
Ethyl benzene		<0.00050		0.00050	mg/L		04-SEP-19	R4794128
o-Xylene		<0.00050		0.00050	mg/L		04-SEP-19	R4794128
m+p-Xylenes		<0.00040		0.00040	mg/L		04-SEP-19	R4794128
F1 (C6-C10)		<0.10		0.10	mg/L		04-SEP-19	R4794128
Surrogate: 4-Bromofluorobenzene (SS)		87.0		70-130	%		04-SEP-19	R4794128
CCME PHC F2-F4 in Water								
F2 (C10-C16)		<0.10		0.10	mg/L	30-AUG-19	30-AUG-19	R4778053
F3 (C16-C34)		<0.25		0.25	mg/L	30-AUG-19	30-AUG-19	R4778053
F4 (C34-C50)		<0.25		0.25	mg/L	30-AUG-19	30-AUG-19	R4778053
Surrogate: 2-Bromobenzotrifluoride		95.2		60-140	%	30-AUG-19	30-AUG-19	R4778053
CCME Total Hydrocarbons								
F1-BTEX		<0.10		0.10	mg/L		11-SEP-19	
F2-Naphth		<0.10		0.10	mg/L		11-SEP-19	
F3-PAH		<0.25		0.25	mg/L		11-SEP-19	
Total Hydrocarbons (C6-C50)		<0.38		0.38	mg/L		11-SEP-19	
Sum of Xylene Isomer Concentrations								
Xylenes (Total)		<0.00064		0.00064	mg/L		11-SEP-19	
Polyaromatic Hydrocarbons (PAHs)								
1-Methyl Naphthalene		<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
2-Methyl Naphthalene		<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Acenaphthene		<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Acenaphthylene		<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Anthracene		<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Acridine		<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(a)anthracene		<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2338359-3 ARV-5							
Sampled By: CLIENT on 26-AUG-19 @ 09:00							
Matrix: WATER							
Polyaromatic Hydrocarbons (PAHs)							
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Chrysene	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	31-AUG-19	06-SEP-19	R4789969
Fluoranthene	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Fluorene	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Naphthalene	<0.000050		0.000050	mg/L	31-AUG-19	06-SEP-19	R4789969
Phenanthrene	<0.000050		0.000050	mg/L	31-AUG-19	06-SEP-19	R4789969
Pyrene	<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Quinoline	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	31-AUG-19	06-SEP-19	R4789969
Surrogate: Acenaphthene d10	94.8		60-130	%	31-AUG-19	06-SEP-19	R4789969
Surrogate: Acridine d9	100.7		60-130	%	31-AUG-19	06-SEP-19	R4789969
Surrogate: Chrysene d12	105.8		60-130	%	31-AUG-19	06-SEP-19	R4789969
Surrogate: Naphthalene d8	95.5		50-130	%	31-AUG-19	06-SEP-19	R4789969
Surrogate: Phenanthrene d10	104.2		60-130	%	31-AUG-19	06-SEP-19	R4789969
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	78.2		1.2	mg/L		03-SEP-19	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		03-SEP-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		03-SEP-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	64.1		1.0	mg/L		30-AUG-19	R4780896
Ammonia by colour							
Ammonia, Total (as N)	0.014		0.010	mg/L		05-SEP-19	R4786151
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		29-AUG-19	R4782960
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		29-AUG-19	R4782960
Chloride in Water by IC							
Chloride (Cl)	173		0.50	mg/L		29-AUG-19	R4777992
Conductivity							
Conductivity	699		1.0	umhos/cm		30-AUG-19	R4780896
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	30	PEHR	10	MPN/100mL		29-AUG-19	R4778251
Hardness Calculated							
Hardness (as CaCO3)	112	HTC	0.20	mg/L		06-SEP-19	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	29-AUG-19	09-SEP-19	R4792194
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		29-AUG-19	R4777992
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		04-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		29-AUG-19	R4777992
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		05-SEP-19	R4783734

* 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
L2338359-3 ARV-5 Sampled By: CLIENT on 26-AUG-19 @ 09:00 Matrix: WATER							
Phenol (4AAP) Phenols (4AAP)	<0.0010		0.0010	mg/L		30-AUG-19	R4781839
Phosphorus, Total Phosphorus (P)-Total	0.0179		0.0030	mg/L		03-SEP-19	R4781470
Sulfate in Water by IC Sulfate (SO4)	12.3		0.30	mg/L		29-AUG-19	R4777992
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0126		0.0030	mg/L	05-SEP-19	05-SEP-19	R4784989
Arsenic (As)-Total	0.00038		0.00010	mg/L	05-SEP-19	05-SEP-19	R4784989
Cadmium (Cd)-Total	0.0000075		0.0000050	mg/L	05-SEP-19	05-SEP-19	R4784989
Calcium (Ca)-Total	22.2		0.050	mg/L	05-SEP-19	05-SEP-19	R4784989
Chromium (Cr)-Total	0.00026		0.00010	mg/L	05-SEP-19	05-SEP-19	R4784989
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	05-SEP-19	05-SEP-19	R4784989
Copper (Cu)-Total	0.00089		0.00050	mg/L	05-SEP-19	05-SEP-19	R4784989
Iron (Fe)-Total	0.464		0.010	mg/L	05-SEP-19	05-SEP-19	R4784989
Lead (Pb)-Total	0.000057		0.000050	mg/L	05-SEP-19	05-SEP-19	R4784989
Magnesium (Mg)-Total	13.7		0.0050	mg/L	05-SEP-19	05-SEP-19	R4784989
Manganese (Mn)-Total	0.0274		0.00010	mg/L	05-SEP-19	05-SEP-19	R4784989
Nickel (Ni)-Total	0.00056		0.00050	mg/L	05-SEP-19	05-SEP-19	R4784989
Potassium (K)-Total	5.77		0.050	mg/L	05-SEP-19	05-SEP-19	R4784989
Sodium (Na)-Total	92.8		0.050	mg/L	05-SEP-19	05-SEP-19	R4784989
Zinc (Zn)-Total	0.0045		0.0030	mg/L	05-SEP-19	05-SEP-19	R4784989
Total Organic Carbon by Combustion Total Organic Carbon	8.04		0.50	mg/L		06-SEP-19	R4788854
Total Suspended Solids Total Suspended Solids	<2.0		2.0	mg/L		30-AUG-19	R4781190
pH pH	7.79		0.10	pH units		30-AUG-19	R4780896
L2338359-4 ARV-6 Sampled By: CLIENT on 26-AUG-19 @ 08:40 Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		04-SEP-19	R4794128
Toluene	0.0019		0.0010	mg/L		04-SEP-19	R4794128
Ethyl benzene	<0.00050		0.00050	mg/L		04-SEP-19	R4794128
o-Xylene	<0.00050		0.00050	mg/L		04-SEP-19	R4794128
m+p-Xylenes	<0.00040		0.00040	mg/L		04-SEP-19	R4794128
F1 (C6-C10)	<0.10		0.10	mg/L		04-SEP-19	R4794128
Surrogate: 4-Bromofluorobenzene (SS)	88.0		70-130	%		04-SEP-19	R4794128
CCME PHC F2-F4 in Water							
F2 (C10-C16)	<0.10		0.10	mg/L	30-AUG-19	05-SEP-19	R4778053
F3 (C16-C34)	<0.25		0.25	mg/L	30-AUG-19	05-SEP-19	R4778053
F4 (C34-C50)	<0.25		0.25	mg/L	30-AUG-19	05-SEP-19	R4778053
Surrogate: 2-Bromobenzotrifluoride	96.9		60-140	%	30-AUG-19	05-SEP-19	R4778053
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		11-SEP-19	
F2-Naphth	<0.10		0.10	mg/L		11-SEP-19	
F3-PAH	<0.25		0.25	mg/L		11-SEP-19	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		11-SEP-19	
Sum of Xylene Isomer Concentrations Xylenes (Total)	<0.00064		0.00064	mg/L		11-SEP-19	

* 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
L2338359-4 ARV-6							
Sampled By: CLIENT on 26-AUG-19 @ 08:40							
Matrix: WATER							
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	0.000036		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
2-Methyl Naphthalene	0.000030		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Acenaphthene	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Acenaphthylene	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Anthracene	<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Acridine	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(a)anthracene	<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Chrysene	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	31-AUG-19	06-SEP-19	R4789969
Fluoranthene	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Fluorene	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Naphthalene	<0.000050		0.000050	mg/L	31-AUG-19	06-SEP-19	R4789969
Phenanthrene	<0.000050		0.000050	mg/L	31-AUG-19	06-SEP-19	R4789969
Pyrene	<0.000010		0.000010	mg/L	31-AUG-19	06-SEP-19	R4789969
Quinoline	<0.000020		0.000020	mg/L	31-AUG-19	06-SEP-19	R4789969
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	31-AUG-19	06-SEP-19	R4789969
Surrogate: Acenaphthene d10	98.6		60-130	%	31-AUG-19	06-SEP-19	R4789969
Surrogate: Acridine d9	106.5		60-130	%	31-AUG-19	06-SEP-19	R4789969
Surrogate: Chrysene d12	116.4		60-130	%	31-AUG-19	06-SEP-19	R4789969
Surrogate: Naphthalene d8	103.7		50-130	%	31-AUG-19	06-SEP-19	R4789969
Surrogate: Phenanthrene d10	110.6		60-130	%	31-AUG-19	06-SEP-19	R4789969
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	102		1.2	mg/L		03-SEP-19	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		03-SEP-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		03-SEP-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	83.2		1.0	mg/L		30-AUG-19	R4780896
Ammonia by colour							
Ammonia, Total (as N)	0.117		0.010	mg/L		05-SEP-19	R4786151
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		29-AUG-19	R4782960
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		29-AUG-19	R4782960
Chloride in Water by IC							
Chloride (Cl)	163		0.50	mg/L		29-AUG-19	R4777992
Conductivity							
Conductivity	677		1.0	umhos/cm		30-AUG-19	R4780896
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	10	PEHR	10	MPN/100mL		29-AUG-19	R4778251
Hardness Calculated							
Hardness (as CaCO3)	156	HTC	0.20	mg/L		11-SEP-19	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	29-AUG-19	09-SEP-19	R4792194
Nitrate in Water by IC							

* 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
L2338359-4	ARV-6							
Sampled By:	CLIENT on 26-AUG-19 @ 08:40							
Matrix:	WATER							
Nitrate in Water by IC								
Nitrate (as N)	<0.020			0.020	mg/L		29-AUG-19	R4777992
Nitrate+Nitrite								
Nitrate and Nitrite as N	<0.070			0.070	mg/L		04-SEP-19	
Nitrite in Water by IC								
Nitrite (as N)	<0.010			0.010	mg/L		29-AUG-19	R4777992
Oil & Grease - Gravimetric								
Oil and Grease	<5.0			5.0	mg/L		09-SEP-19	R4791490
Phenol (4AAP)								
Phenols (4AAP)	<0.0010			0.0010	mg/L		30-AUG-19	R4781839
Phosphorus, Total								
Phosphorus (P)-Total	0.0412			0.0030	mg/L		03-SEP-19	R4781470
Sulfate in Water by IC								
Sulfate (SO4)	0.51			0.30	mg/L		29-AUG-19	R4777992
Total Metals in Water by CRC ICPMS								
Aluminum (Al)-Total	0.201			0.0030	mg/L	06-SEP-19	06-SEP-19	R4788490
Arsenic (As)-Total	0.00085			0.00010	mg/L	06-SEP-19	06-SEP-19	R4788490
Cadmium (Cd)-Total	0.0000252			0.0000050	mg/L	06-SEP-19	06-SEP-19	R4788490
Calcium (Ca)-Total	40.5			0.050	mg/L	06-SEP-19	06-SEP-19	R4788490
Chromium (Cr)-Total	0.00103			0.00010	mg/L	06-SEP-19	06-SEP-19	R4788490
Cobalt (Co)-Total	0.00143			0.00010	mg/L	06-SEP-19	06-SEP-19	R4788490
Copper (Cu)-Total	0.00108			0.00050	mg/L	06-SEP-19	06-SEP-19	R4788490
Iron (Fe)-Total	13.2			0.010	mg/L	06-SEP-19	06-SEP-19	R4788490
Lead (Pb)-Total	0.000344			0.000050	mg/L	06-SEP-19	06-SEP-19	R4788490
Magnesium (Mg)-Total	13.3			0.0050	mg/L	06-SEP-19	06-SEP-19	R4788490
Manganese (Mn)-Total	1.49			0.010	mg/L	06-SEP-19	10-SEP-19	R4795793
Nickel (Ni)-Total	0.00151			0.00050	mg/L	06-SEP-19	06-SEP-19	R4788490
Potassium (K)-Total	6.27			0.050	mg/L	06-SEP-19	06-SEP-19	R4788490
Sodium (Na)-Total	67.7			0.050	mg/L	06-SEP-19	06-SEP-19	R4788490
Zinc (Zn)-Total	0.0160			0.0030	mg/L	06-SEP-19	06-SEP-19	R4788490
Total Organic Carbon by Combustion								
Total Organic Carbon	8.31			0.50	mg/L		06-SEP-19	R4788854
Total Suspended Solids								
Total Suspended Solids	45.1			2.0	mg/L		30-AUG-19	R4781190
pH								
pH	7.28			0.10	pH units		30-AUG-19	R4780896

* 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.
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.
RRR	Refer to Report Remarks for issues regarding this 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.			
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°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.			
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.

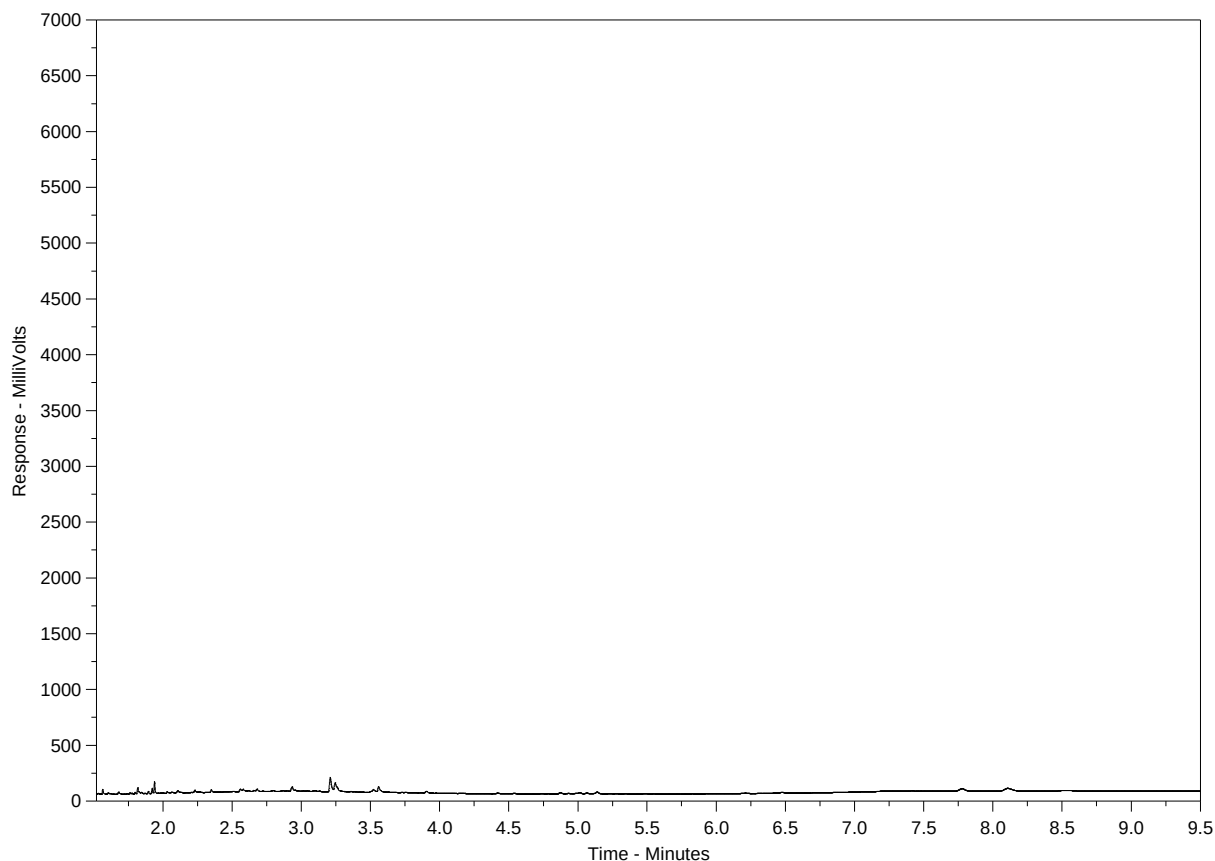
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2338359-1
Client Sample ID: ARV-2



← 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.

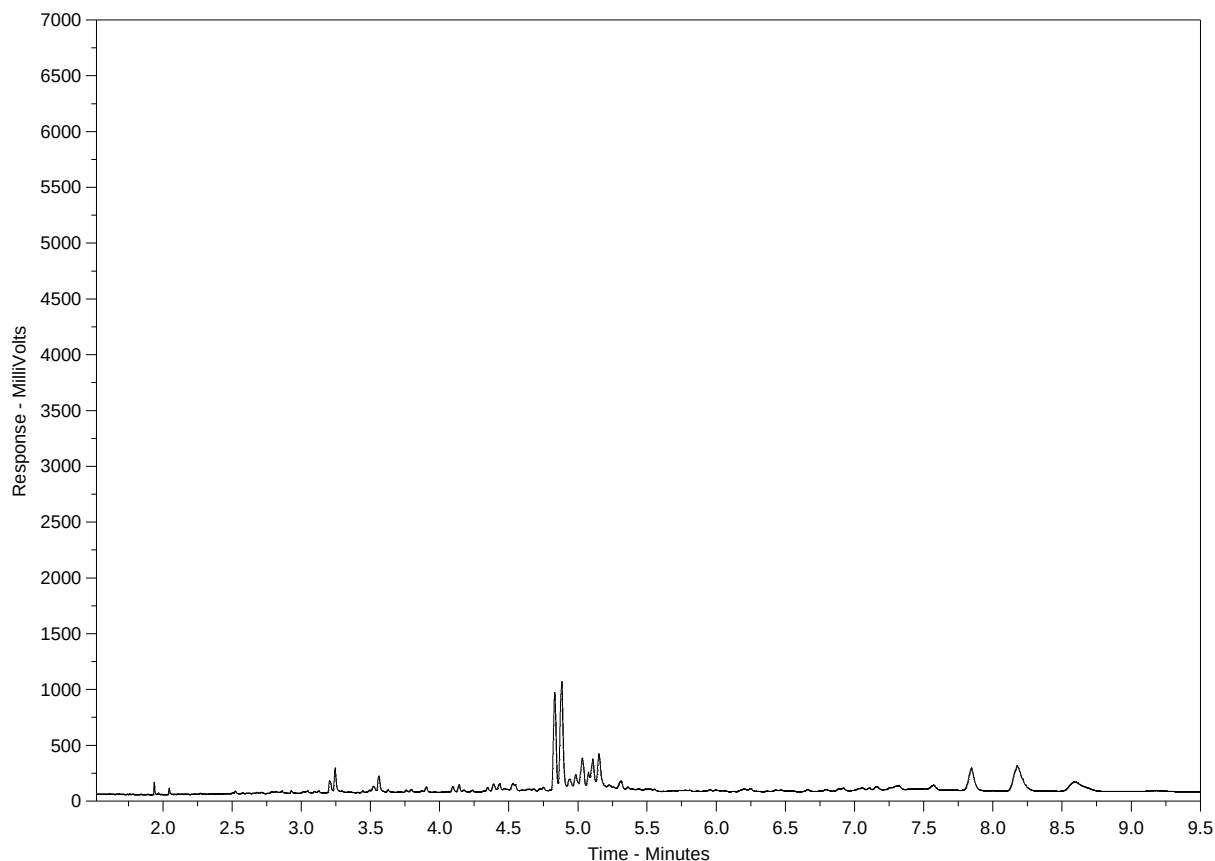
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2338359-2
Client Sample ID: ARV-4



← 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.

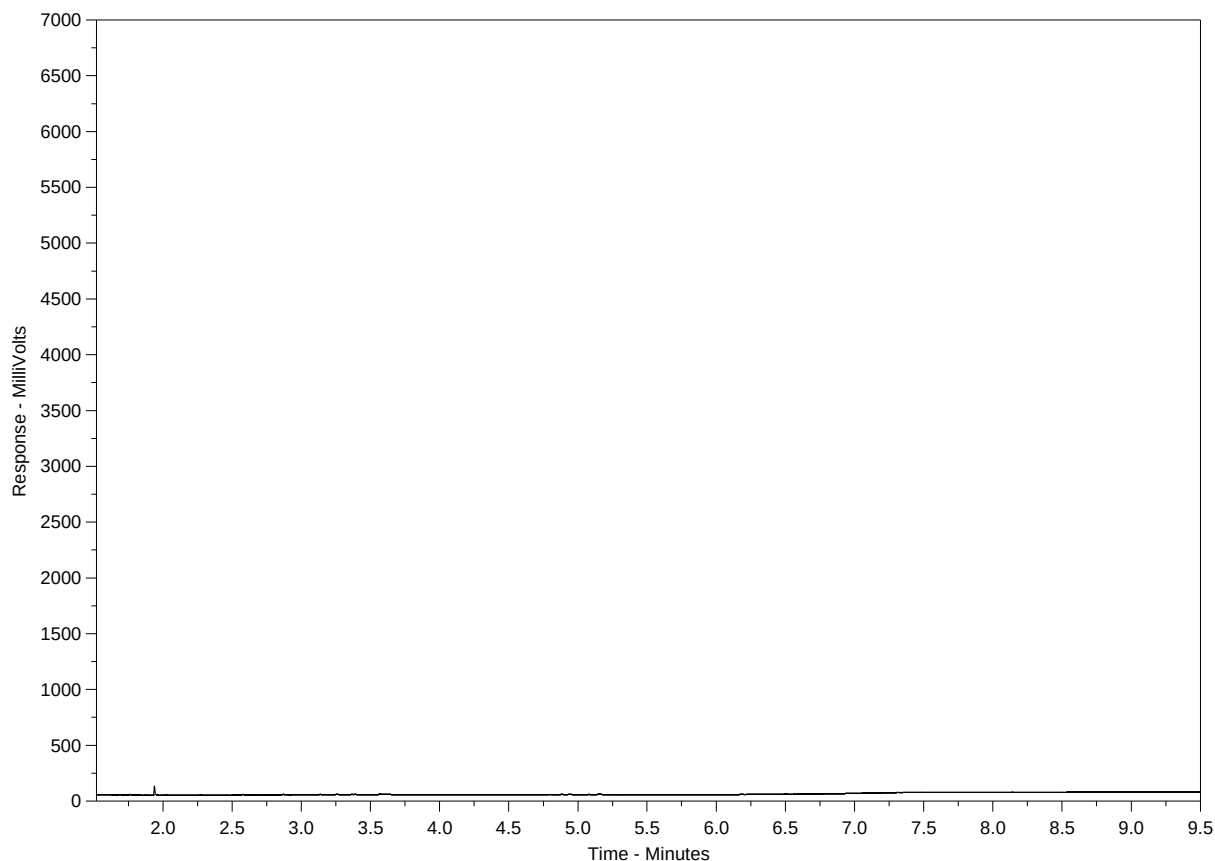
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2338359-3
Client Sample ID: ARV-5



← 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.

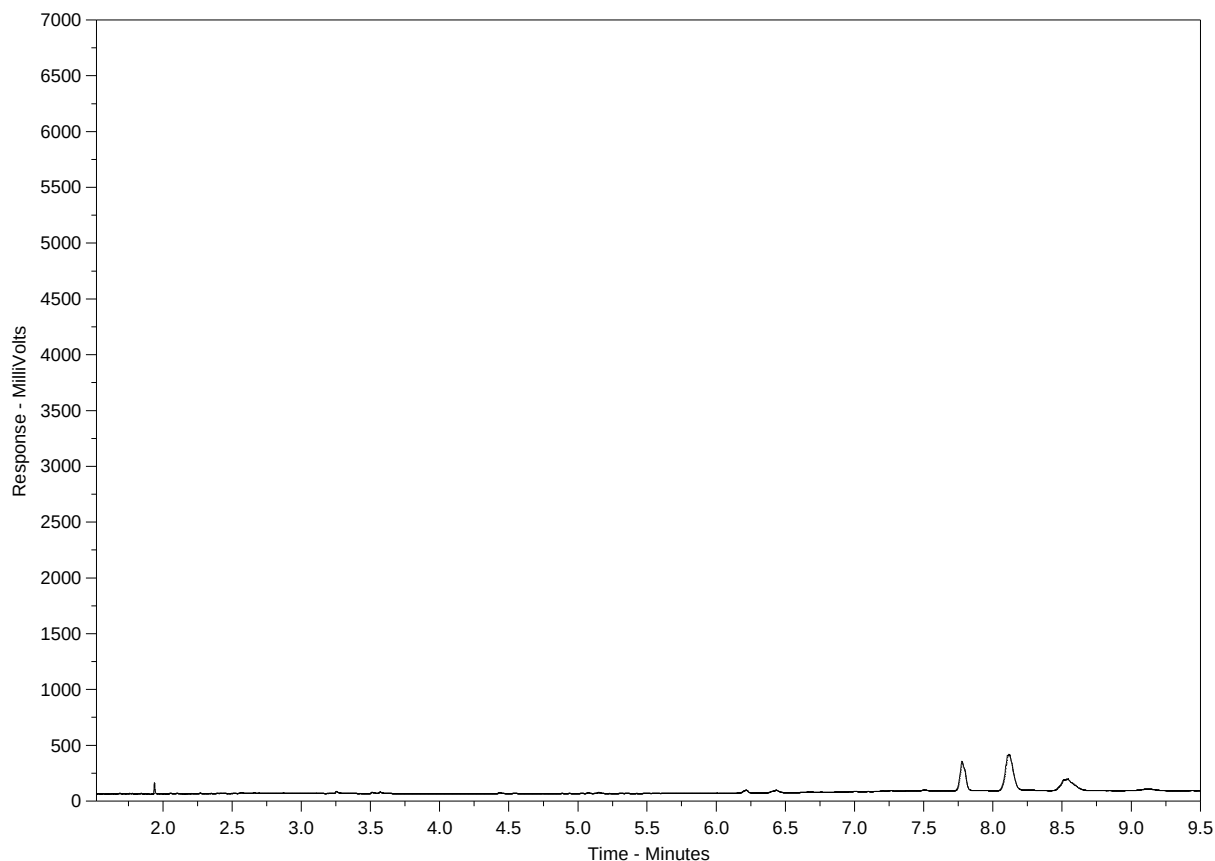
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2338359-4
Client Sample ID: ARV-6



← 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.



L2338359-COFC

COC Number: 17-747860

Page 1 of 1

Report To Contact and company name below will appear on the final report		Report Format / Distribution		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)																																																																																				
Company: Hamlet of Arviat		Select Report Format: ☒ PDF ☐ EXCEL ☐ EOD (DIGITAL)		Regular [R] ☒ Standard TAT if received by 3 pm - business days - no surcharges apply																																																																																				
Contact: Steve England		Quality Control (QC) Report with Report: ☒ YES ☐ NO		4 day [P4-20%] ☐ 1 Business day [E - 100%] ☐																																																																																				
Phone: 867-857-2841		☐ Compare Results to Criteria on Report - provide details if not checked		3 day [P3-25%] ☐ Same Day Weekend or Statutory holiday [E2 - 200%] ☐																																																																																				
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City/Province: ARVIAT, AB		Email 2: scott@arviat.ca		For tests that cannot be performed according to the service level selected, you will be contacted.																																																																																				
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Invoice To: Same as Report To ☒ YES ☐ NO		Invoice Distribution		<table border="1"> <thead> <tr> <th rowspan="2">NUMBER OF CONTAINERS</th> <th colspan="12">Indicate Filled (F), Preserved (P) or Filled and Preserved (F/P) below</th> <th rowspan="2">SAMPLES ON HOLD</th> </tr> <tr> <th>Nutrients</th> <th>Oil & Grease</th> <th>PAH/EPH/F2-PY</th> <th>PAH/EPH/F2-FY</th> <th>Sulfuric Acid</th> <th>Hydrochloric Acid</th> <th>Nitric Acid</th> <th>Bacteria</th> <th>BTEX/VOCx3</th> <th>Rockline</th> <th>B.O.C</th> <th>EPH/EPH/HG/PH</th> <th>EP2-FY, PH/HS</th> </tr> </thead> <tbody> <tr> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> </tbody> </table>		NUMBER OF CONTAINERS	Indicate Filled (F), Preserved (P) or Filled and Preserved (F/P) below												SAMPLES ON HOLD	Nutrients	Oil & Grease	PAH/EPH/F2-PY	PAH/EPH/F2-FY	Sulfuric Acid	Hydrochloric Acid	Nitric Acid	Bacteria	BTEX/VOCx3	Rockline	B.O.C	EPH/EPH/HG/PH	EP2-FY, PH/HS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
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Contact:		Email 2:																																																																																						
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ARV-4		2019-08-29 13:00																																																																																						
ARV-5		2019-08-29 13:00																																																																																						
ARV-6		2019-08-29 13:00																																																																																						
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Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)																																																																																								
Are samples taken from a Regulated DW System? ☒ YES ☐ NO																																																																																								
Are samples for human consumption use? ☒ YES ☐ NO																																																																																								
SHIPMENT RELEASE (client use)																																																																																								
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Hamlet of Arviat
ATTN: STEVE ENGLAND
PO Box 150
Arviat NU X0C 0E0

Date Received: 21-SEP-19
Report Date: 08-OCT-19 14:34 (MT)
Version: FINAL

Client Phone: 867-857-2841

Certificate of Analysis

Lab Work Order #: L2351932
Project P.O. #: NOT SUBMITTED
Job Reference: HAMLET OF ARVIAT
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
L2351932-1 ARV-2							
Sampled By: CLIENT on 20-SEP-19 @ 08:46							
Matrix: WATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050	VOCHS	0.00050	mg/L		23-SEP-19	R4834946
Toluene	<0.0010	VOCHS	0.0010	mg/L		23-SEP-19	R4834946
Ethyl benzene	<0.00050	VOCHS	0.00050	mg/L		23-SEP-19	R4834946
o-Xylene	<0.00050	VOCHS	0.00050	mg/L		23-SEP-19	R4834946
m+p-Xylenes	<0.00040	VOCHS	0.00040	mg/L		23-SEP-19	R4834946
F1 (C6-C10)	<0.10	VOCHS	0.10	mg/L		23-SEP-19	R4834946
Surrogate: 4-Bromofluorobenzene (SS)	96.2		70-130	%		23-SEP-19	R4834946
CCME PHC F2-F4 in Water							
F2 (C10-C16)	0.14		0.10	mg/L	26-SEP-19	26-SEP-19	R4849537
F3 (C16-C34)	<0.25		0.25	mg/L	26-SEP-19	26-SEP-19	R4849537
F4 (C34-C50)	<0.25		0.25	mg/L	26-SEP-19	26-SEP-19	R4849537
Surrogate: 2-Bromobenzotrifluoride	106.1		60-140	%	26-SEP-19	26-SEP-19	R4849537
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		02-OCT-19	
F2-Naphth	0.14		0.10	mg/L		02-OCT-19	
F3-PAH	<0.25		0.25	mg/L		02-OCT-19	
Total Hydrocarbons (C6-C50)	<0.38		0.38	mg/L		02-OCT-19	
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.00064		0.00064	mg/L		24-SEP-19	
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Acenaphthene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Acenaphthylene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Anthracene	<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Acridine	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(a)anthracene	<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Chrysene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	27-SEP-19	30-SEP-19	R4851249
Fluoranthene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Fluorene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Naphthalene	<0.000050		0.000050	mg/L	27-SEP-19	30-SEP-19	R4851249
Phenanthrene	<0.000050		0.000050	mg/L	27-SEP-19	30-SEP-19	R4851249
Pyrene	<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Quinoline	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	27-SEP-19	30-SEP-19	R4851249
Surrogate: Acenaphthene d10	101.6		60-130	%	27-SEP-19	30-SEP-19	R4851249
Surrogate: Acridine d9	112.1		60-130	%	27-SEP-19	30-SEP-19	R4851249
Surrogate: Chrysene d12	108.2		60-130	%	27-SEP-19	30-SEP-19	R4851249
Surrogate: Naphthalene d8	99.0		50-130	%	27-SEP-19	30-SEP-19	R4851249
Surrogate: Phenanthrene d10	112.6		60-130	%	27-SEP-19	30-SEP-19	R4851249
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	786		1.2	mg/L		25-SEP-19	
Alkalinity, Carbonate							

* 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
L2351932-1 ARV-2							
Sampled By: CLIENT on 20-SEP-19 @ 08:46							
Matrix: WATER							
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		25-SEP-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-SEP-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	645		1.0	mg/L		24-SEP-19	R4838730
Ammonia by colour							
Ammonia, Total (as N)	13.1		2.0	mg/L		27-SEP-19	R4849141
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	9.0		2.0	mg/L		23-SEP-19	R4850297
Carbonaceous BOD							
BOD Carbonaceous	<6		6.0	mg/L		23-SEP-19	R4850297
Chloride in Water by IC							
Chloride (Cl)	415		10	mg/L		21-SEP-19	R4841049
Conductivity							
Conductivity	3110		1.0	umhos/cm		24-SEP-19	R4838730
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	60		10	MPN/100mL		21-SEP-19	R4832848
Hardness Calculated							
Hardness (as CaCO3)	1310	HTC	0.20	mg/L		08-OCT-19	
Mercury Total							
Mercury (Hg)-Total	0.0000090		0.0000050	mg/L	27-SEP-19	01-OCT-19	R4855168
Nitrate in Water by IC							
Nitrate (as N)	<0.40	DLM	0.40	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.45		0.45	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.20	DLM	0.20	mg/L		21-SEP-19	R4841049
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		30-SEP-19	R4850733
Phenol (4AAP)							
Phenols (4AAP)	0.0029		0.0010	mg/L		24-SEP-19	R4836271
Phosphorus, Total							
Phosphorus (P)-Total	0.538		0.0030	mg/L		25-SEP-19	R4839654
Sulfate in Water by IC							
Sulfate (SO4)	803		6.0	mg/L		21-SEP-19	R4841049
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0125		0.0030	mg/L	26-SEP-19	26-SEP-19	R4850120
Arsenic (As)-Total	0.00750		0.00010	mg/L	26-SEP-19	26-SEP-19	R4850120
Cadmium (Cd)-Total	0.0000530		0.0000050	mg/L	26-SEP-19	26-SEP-19	R4850120
Calcium (Ca)-Total	396		0.050	mg/L	26-SEP-19	26-SEP-19	R4850120
Chromium (Cr)-Total	0.00093		0.00010	mg/L	26-SEP-19	26-SEP-19	R4850120
Cobalt (Co)-Total	0.00104		0.00010	mg/L	26-SEP-19	26-SEP-19	R4850120
Copper (Cu)-Total	0.0118		0.00050	mg/L	26-SEP-19	26-SEP-19	R4850120
Iron (Fe)-Total	1.05		0.010	mg/L	26-SEP-19	26-SEP-19	R4850120
Lead (Pb)-Total	0.00161		0.000050	mg/L	26-SEP-19	26-SEP-19	R4850120
Magnesium (Mg)-Total	78.5		0.0050	mg/L	26-SEP-19	26-SEP-19	R4850120
Manganese (Mn)-Total	1.44		0.0010	mg/L	26-SEP-19	04-OCT-19	R4861414
Nickel (Ni)-Total	0.00923		0.00050	mg/L	26-SEP-19	26-SEP-19	R4850120
Potassium (K)-Total	72.7		0.050	mg/L	26-SEP-19	26-SEP-19	R4850120
Sodium (Na)-Total	305		0.050	mg/L	26-SEP-19	26-SEP-19	R4850120
Zinc (Zn)-Total	0.0330		0.0030	mg/L	26-SEP-19	26-SEP-19	R4850120
Total Organic Carbon by Combustion							

* 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
L2351932-1	ARV-2							
Sampled By: CLIENT on 20-SEP-19 @ 08:46								
Matrix: WATER								
Total Organic Carbon by Combustion								
Total Organic Carbon		42.4		0.50	mg/L		26-SEP-19	R4849225
Total Suspended Solids								
Total Suspended Solids		16.3		2.0	mg/L		27-SEP-19	R4849648
pH								
pH		7.96		0.10	pH units		24-SEP-19	R4838730
L2351932-2	ARV-4							
Sampled By: CLIENT on 20-SEP-19 @ 08:26								
Matrix: WATER								
BTEX plus F1-F4								
BTX plus F1 by GCMS								
Benzene		<0.00050	VOCHS	0.00050	mg/L		24-SEP-19	R4834946
Toluene		0.0050	VOCHS	0.0010	mg/L		24-SEP-19	R4834946
Ethyl benzene		<0.00050	VOCHS	0.00050	mg/L		24-SEP-19	R4834946
o-Xylene		<0.00050	VOCHS	0.00050	mg/L		24-SEP-19	R4834946
m+p-Xylenes		<0.00040	VOCHS	0.00040	mg/L		24-SEP-19	R4834946
F1 (C6-C10)		<0.10	VOCHS	0.10	mg/L		24-SEP-19	R4834946
Surrogate: 4-Bromofluorobenzene (SS)		94.0		70-130	%		24-SEP-19	R4834946
CCME PHC F2-F4 in Water								
F2 (C10-C16)		<0.10		0.10	mg/L	26-SEP-19	26-SEP-19	R4849537
F3 (C16-C34)		1.54		0.25	mg/L	26-SEP-19	26-SEP-19	R4849537
F4 (C34-C50)		0.49		0.25	mg/L	26-SEP-19	26-SEP-19	R4849537
Surrogate: 2-Bromobenzotrifluoride		105.5		60-140	%	26-SEP-19	26-SEP-19	R4849537
CCME Total Hydrocarbons								
F1-BTEX		<0.10		0.10	mg/L		02-OCT-19	
F2-Naphth		<0.10		0.10	mg/L		02-OCT-19	
F3-PAH		1.54		0.25	mg/L		02-OCT-19	
Total Hydrocarbons (C6-C50)		2.03		0.38	mg/L		02-OCT-19	
Sum of Xylene Isomer Concentrations								
Xylenes (Total)		<0.00064		0.00064	mg/L		24-SEP-19	
Polyaromatic Hydrocarbons (PAHs)								
1-Methyl Naphthalene		<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
2-Methyl Naphthalene		<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Acenaphthene		<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Acenaphthylene		<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Anthracene		<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Acridine		0.000041		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(a)anthracene		<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(a)pyrene		<0.0000050		0.0000050	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(b&j)fluoranthene		<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(g,h,i)perylene		<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(k)fluoranthene		<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Chrysene		<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Dibenzo(a,h)anthracene		<0.0000050		0.0000050	mg/L	27-SEP-19	30-SEP-19	R4851249
Fluoranthene		<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Fluorene		<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Indeno(1,2,3-cd)pyrene		<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Naphthalene		<0.000050		0.000050	mg/L	27-SEP-19	30-SEP-19	R4851249
Phenanthrene		<0.000050		0.000050	mg/L	27-SEP-19	30-SEP-19	R4851249
Pyrene		<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Quinoline		0.000031		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249

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

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2351932-2 ARV-4							
Sampled By: CLIENT on 20-SEP-19 @ 08:26							
Matrix: WATER							
Polyaromatic Hydrocarbons (PAHs)							
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	27-SEP-19	30-SEP-19	R4851249
Surrogate: Acenaphthene d10	104.4		60-130	%	27-SEP-19	30-SEP-19	R4851249
Surrogate: Acridine d9	112.2		60-130	%	27-SEP-19	30-SEP-19	R4851249
Surrogate: Chrysene d12	116.7		60-130	%	27-SEP-19	30-SEP-19	R4851249
Surrogate: Naphthalene d8	93.5		50-130	%	27-SEP-19	30-SEP-19	R4851249
Surrogate: Phenanthrene d10	118.9		60-130	%	27-SEP-19	30-SEP-19	R4851249
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	86.6		1.2	mg/L		25-SEP-19	
Alkalinity, Carbonate							
Carbonate (CO3)	24.0		0.60	mg/L		25-SEP-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-SEP-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	111		1.0	mg/L		24-SEP-19	R4838730
Ammonia by colour							
Ammonia, Total (as N)	5.95		0.20	mg/L		28-SEP-19	R4850813
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	51		20	mg/L		23-SEP-19	R4850297
Carbonaceous BOD							
BOD Carbonaceous	25.4		6.0	mg/L		23-SEP-19	R4850297
Chloride in Water by IC							
Chloride (Cl)	87.8		0.50	mg/L		21-SEP-19	R4841049
Conductivity							
Conductivity	477		1.0	umhos/cm		24-SEP-19	R4838730
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	3870		10	MPN/100mL		21-SEP-19	R4832848
Hardness Calculated							
Hardness (as CaCO3)	61.2	HTC	0.20	mg/L		30-SEP-19	
Mercury Total							
Mercury (Hg)-Total	0.0000050		0.0000050	mg/L	27-SEP-19	01-OCT-19	R4855168
Nitrate in Water by IC							
Nitrate (as N)	0.455		0.020	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.833		0.070	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	0.378		0.010	mg/L		21-SEP-19	R4841049
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		30-SEP-19	R4850733
Phenol (4AAP)							
Phenols (4AAP)	0.0065	DLM	0.0050	mg/L		24-SEP-19	R4836271
Phosphorus, Total							
Phosphorus (P)-Total	6.64		0.060	mg/L		25-SEP-19	R4839654
Sulfate in Water by IC							
Sulfate (SO4)	8.94		0.30	mg/L		21-SEP-19	R4841049
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.191		0.0030	mg/L	26-SEP-19	26-SEP-19	R4850120
Arsenic (As)-Total	0.00672		0.00010	mg/L	26-SEP-19	26-SEP-19	R4850120
Cadmium (Cd)-Total	0.0000711		0.0000050	mg/L	26-SEP-19	26-SEP-19	R4850120
Calcium (Ca)-Total	11.9		0.050	mg/L	26-SEP-19	26-SEP-19	R4850120
Chromium (Cr)-Total	0.00142		0.00010	mg/L	26-SEP-19	26-SEP-19	R4850120
Cobalt (Co)-Total	0.00144		0.00010	mg/L	26-SEP-19	26-SEP-19	R4850120

* 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
L2351932-2 ARV-4								
Sampled By: CLIENT on 20-SEP-19 @ 08:26								
Matrix: WATER								
Total Metals in Water by CRC ICPMS								
Copper (Cu)-Total		0.0337		0.00050	mg/L	26-SEP-19	26-SEP-19	R4850120
Iron (Fe)-Total		2.48		0.010	mg/L	26-SEP-19	26-SEP-19	R4850120
Lead (Pb)-Total		0.00133		0.000050	mg/L	26-SEP-19	26-SEP-19	R4850120
Magnesium (Mg)-Total		7.65		0.0050	mg/L	26-SEP-19	26-SEP-19	R4850120
Manganese (Mn)-Total		0.179		0.00010	mg/L	26-SEP-19	26-SEP-19	R4850120
Nickel (Ni)-Total		0.00580		0.00050	mg/L	26-SEP-19	26-SEP-19	R4850120
Potassium (K)-Total		22.5		0.050	mg/L	26-SEP-19	26-SEP-19	R4850120
Sodium (Na)-Total		74.1		0.050	mg/L	26-SEP-19	26-SEP-19	R4850120
Zinc (Zn)-Total		0.0271		0.0030	mg/L	26-SEP-19	26-SEP-19	R4850120
Total Organic Carbon by Combustion								
Total Organic Carbon		112		2.5	mg/L		26-SEP-19	R4849225
Total Suspended Solids								
Total Suspended Solids		224		30	mg/L		27-SEP-19	R4849648
pH								
pH		9.37		0.10	pH units		24-SEP-19	R4838730
L2351932-3 ARV-5								
Sampled By: CLIENT on 20-SEP-19 @ 09:26								
Matrix: WATER								
BTEX plus F1-F4								
BTX plus F1 by GCMS								
Benzene		<0.00050		0.00050	mg/L		23-SEP-19	R4834946
Toluene		<0.0010		0.0010	mg/L		23-SEP-19	R4834946
Ethyl benzene		<0.00050		0.00050	mg/L		23-SEP-19	R4834946
o-Xylene		<0.00050		0.00050	mg/L		23-SEP-19	R4834946
m+p-Xylenes		<0.00040		0.00040	mg/L		23-SEP-19	R4834946
F1 (C6-C10)		<0.10		0.10	mg/L		23-SEP-19	R4834946
Surrogate: 4-Bromofluorobenzene (SS)		97.8		70-130	%		23-SEP-19	R4834946
CCME PHC F2-F4 in Water								
F2 (C10-C16)		<0.10		0.10	mg/L	26-SEP-19	26-SEP-19	R4849537
F3 (C16-C34)		<0.25		0.25	mg/L	26-SEP-19	26-SEP-19	R4849537
F4 (C34-C50)		<0.25		0.25	mg/L	26-SEP-19	26-SEP-19	R4849537
Surrogate: 2-Bromobenzotrifluoride		108.6		60-140	%	26-SEP-19	26-SEP-19	R4849537
CCME Total Hydrocarbons								
F1-BTEX		<0.10		0.10	mg/L		02-OCT-19	
F2-Naphth		<0.10		0.10	mg/L		02-OCT-19	
F3-PAH		<0.25		0.25	mg/L		02-OCT-19	
Total Hydrocarbons (C6-C50)		<0.38		0.38	mg/L		02-OCT-19	
Sum of Xylene Isomer Concentrations								
Xylenes (Total)		<0.00064		0.00064	mg/L		24-SEP-19	
Polyaromatic Hydrocarbons (PAHs)								
1-Methyl Naphthalene		<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
2-Methyl Naphthalene		<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Acenaphthene		<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Acenaphthylene		<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Anthracene		<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Acridine		<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(a)anthracene		<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(a)pyrene		<0.0000050		0.0000050	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(b&j)fluoranthene		<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(g,h,i)perylene		<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249

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

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2351932-3 ARV-5							
Sampled By: CLIENT on 20-SEP-19 @ 09:26							
Matrix: WATER							
Polyaromatic Hydrocarbons (PAHs)							
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Chrysene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	27-SEP-19	30-SEP-19	R4851249
Fluoranthene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Fluorene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Naphthalene	<0.000050		0.000050	mg/L	27-SEP-19	30-SEP-19	R4851249
Phenanthrene	<0.000050		0.000050	mg/L	27-SEP-19	30-SEP-19	R4851249
Pyrene	<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Quinoline	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	27-SEP-19	30-SEP-19	R4851249
Surrogate: Acenaphthene d10	100.7		60-130	%	27-SEP-19	30-SEP-19	R4851249
Surrogate: Acridine d9	101.1		60-130	%	27-SEP-19	30-SEP-19	R4851249
Surrogate: Chrysene d12	114.4		60-130	%	27-SEP-19	30-SEP-19	R4851249
Surrogate: Naphthalene d8	101.4		50-130	%	27-SEP-19	30-SEP-19	R4851249
Surrogate: Phenanthrene d10	107.8		60-130	%	27-SEP-19	30-SEP-19	R4851249
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	76.0		1.2	mg/L		25-SEP-19	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		25-SEP-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-SEP-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	62.3		1.0	mg/L		24-SEP-19	R4838730
Ammonia by colour							
Ammonia, Total (as N)	0.018		0.010	mg/L		27-SEP-19	R4849141
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		23-SEP-19	R4850297
Carbonaceous BOD							
BOD Carbonaceous	<6.0		6.0	mg/L		23-SEP-19	R4850297
Chloride in Water by IC							
Chloride (Cl)	176		0.50	mg/L		21-SEP-19	R4841049
Conductivity							
Conductivity	676		1.0	umhos/cm		24-SEP-19	R4838730
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10		10	MPN/100mL		21-SEP-19	R4832848
Hardness Calculated							
Hardness (as CaCO3)	109	HTC	0.20	mg/L		30-SEP-19	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	27-SEP-19	01-OCT-19	R4855168
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		21-SEP-19	R4841049
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		30-SEP-19	R4850733
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-SEP-19	R4836271
Phosphorus, Total							

* 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
L2351932-3	ARV-5							
Sampled By: CLIENT on 20-SEP-19 @ 09:26								
Matrix: WATER								
Phosphorus, Total								
Phosphorus (P)-Total		0.0190		0.0030	mg/L		25-SEP-19	R4839654
Sulfate in Water by IC								
Sulfate (SO4)		12.1		0.30	mg/L		21-SEP-19	R4841049
Total Metals in Water by CRC ICPMS								
Aluminum (Al)-Total		0.0196		0.0030	mg/L	26-SEP-19	26-SEP-19	R4850120
Arsenic (As)-Total		0.00040		0.00010	mg/L	26-SEP-19	26-SEP-19	R4850120
Cadmium (Cd)-Total		<0.0000050		0.0000050	mg/L	26-SEP-19	26-SEP-19	R4850120
Calcium (Ca)-Total		19.8		0.050	mg/L	26-SEP-19	26-SEP-19	R4850120
Chromium (Cr)-Total		0.00018		0.00010	mg/L	26-SEP-19	26-SEP-19	R4850120
Cobalt (Co)-Total		<0.00010		0.00010	mg/L	26-SEP-19	26-SEP-19	R4850120
Copper (Cu)-Total		0.00068		0.00050	mg/L	26-SEP-19	26-SEP-19	R4850120
Iron (Fe)-Total		0.742		0.010	mg/L	26-SEP-19	26-SEP-19	R4850120
Lead (Pb)-Total		0.000095		0.000050	mg/L	26-SEP-19	26-SEP-19	R4850120
Magnesium (Mg)-Total		14.4		0.0050	mg/L	26-SEP-19	26-SEP-19	R4850120
Manganese (Mn)-Total		0.0203		0.00010	mg/L	26-SEP-19	26-SEP-19	R4850120
Nickel (Ni)-Total		0.00064		0.00050	mg/L	26-SEP-19	26-SEP-19	R4850120
Potassium (K)-Total		5.96		0.050	mg/L	26-SEP-19	26-SEP-19	R4850120
Sodium (Na)-Total		92.0		0.050	mg/L	26-SEP-19	26-SEP-19	R4850120
Zinc (Zn)-Total		0.0037		0.0030	mg/L	26-SEP-19	26-SEP-19	R4850120
Total Organic Carbon by Combustion								
Total Organic Carbon		9.37		0.50	mg/L		26-SEP-19	R4849225
Total Suspended Solids								
Total Suspended Solids		<2.0		2.0	mg/L		27-SEP-19	R4849648
pH								
pH		7.70		0.10	pH units		24-SEP-19	R4838730
L2351932-4	ARV-6							
Sampled By: CLIENT on 20-SEP-19 @ 09:32								
Matrix: WATER								
BTEX plus F1-F4								
BTX plus F1 by GCMS								
Benzene		<0.00050	VOCHS	0.00050	mg/L		24-SEP-19	R4834946
Toluene		0.0033	VOCHS	0.0010	mg/L		24-SEP-19	R4834946
Ethyl benzene		<0.00050	VOCHS	0.00050	mg/L		24-SEP-19	R4834946
o-Xylene		<0.00050	VOCHS	0.00050	mg/L		24-SEP-19	R4834946
m+p-Xylenes		<0.00040	VOCHS	0.00040	mg/L		24-SEP-19	R4834946
F1 (C6-C10)		<0.10	VOCHS	0.10	mg/L		24-SEP-19	R4834946
Surrogate: 4-Bromofluorobenzene (SS)		96.9		70-130	%		24-SEP-19	R4834946
CCME PHC F2-F4 in Water								
F2 (C10-C16)		<0.10		0.10	mg/L	26-SEP-19	26-SEP-19	R4849537
F3 (C16-C34)		<0.25		0.25	mg/L	26-SEP-19	26-SEP-19	R4849537
F4 (C34-C50)		<0.25		0.25	mg/L	26-SEP-19	26-SEP-19	R4849537
Surrogate: 2-Bromobenzotrifluoride		108.4		60-140	%	26-SEP-19	26-SEP-19	R4849537
CCME Total Hydrocarbons								
F1-BTEX		<0.10		0.10	mg/L		02-OCT-19	
F2-Naphth		<0.10		0.10	mg/L		02-OCT-19	
F3-PAH		<0.25		0.25	mg/L		02-OCT-19	
Total Hydrocarbons (C6-C50)		<0.38		0.38	mg/L		02-OCT-19	
Sum of Xylene Isomer Concentrations								
Xylenes (Total)		<0.00064		0.00064	mg/L		24-SEP-19	
Polyaromatic Hydrocarbons (PAHs)								

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

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2351932-4 ARV-6							
Sampled By: CLIENT on 20-SEP-19 @ 09:32							
Matrix: WATER							
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	0.000026		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Acenaphthene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Acenaphthylene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Anthracene	<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Acridine	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(a)anthracene	<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Chrysene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	27-SEP-19	30-SEP-19	R4851249
Fluoranthene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Fluorene	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Naphthalene	<0.000050		0.000050	mg/L	27-SEP-19	30-SEP-19	R4851249
Phenanthrene	<0.000050		0.000050	mg/L	27-SEP-19	30-SEP-19	R4851249
Pyrene	<0.000010		0.000010	mg/L	27-SEP-19	30-SEP-19	R4851249
Quinoline	<0.000020		0.000020	mg/L	27-SEP-19	30-SEP-19	R4851249
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	27-SEP-19	30-SEP-19	R4851249
Surrogate: Acenaphthene d10	107.8		60-130	%	27-SEP-19	30-SEP-19	R4851249
Surrogate: Acridine d9	112.8		60-130	%	27-SEP-19	30-SEP-19	R4851249
Surrogate: Chrysene d12	108.8		60-130	%	27-SEP-19	30-SEP-19	R4851249
Surrogate: Naphthalene d8	109.8		50-130	%	27-SEP-19	30-SEP-19	R4851249
Surrogate: Phenanthrene d10	118.0		60-130	%	27-SEP-19	30-SEP-19	R4851249
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	115		1.2	mg/L		25-SEP-19	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		25-SEP-19	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		25-SEP-19	
Alkalinity, Total (as CaCO3)							
Alkalinity, Total (as CaCO3)	94.4		1.0	mg/L		24-SEP-19	R4838730
Ammonia by colour							
Ammonia, Total (as N)	0.145		0.010	mg/L		27-SEP-19	R4850813
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<6.0		6.0	mg/L		23-SEP-19	R4850297
Carbonaceous BOD							
BOD Carbonaceous	<6.0		6.0	mg/L		23-SEP-19	R4850297
Chloride in Water by IC							
Chloride (Cl)	184		0.50	mg/L		21-SEP-19	R4841049
Conductivity							
Conductivity	721		1.0	umhos/cm		24-SEP-19	R4838730
Fecal coliforms, 1:10 dilution by QT97							
Fecal Coliforms	<10		10	MPN/100mL		21-SEP-19	R4832848
Hardness Calculated							
Hardness (as CaCO3)	180	HTC	0.20	mg/L		08-OCT-19	
Mercury Total							
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L	27-SEP-19	01-OCT-19	R4855168
Nitrate in Water by IC							

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

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2351932-4 ARV-6							
Sampled By: CLIENT on 20-SEP-19 @ 09:32							
Matrix: WATER							
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		21-SEP-19	R4841049
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		26-SEP-19	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		21-SEP-19	R4841049
Oil & Grease - Gravimetric							
Oil and Grease	<5.0		5.0	mg/L		30-SEP-19	R4850733
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		24-SEP-19	R4836271
Phosphorus, Total							
Phosphorus (P)-Total	0.102		0.0030	mg/L		25-SEP-19	R4839654
Sulfate in Water by IC							
Sulfate (SO4)	<0.30		0.30	mg/L		21-SEP-19	R4841049
Total Metals in Water by CRC ICPMS							
Aluminum (Al)-Total	0.0806		0.0030	mg/L	26-SEP-19	26-SEP-19	R4850120
Arsenic (As)-Total	0.00085		0.00010	mg/L	26-SEP-19	26-SEP-19	R4850120
Cadmium (Cd)-Total	0.0000055		0.0000050	mg/L	26-SEP-19	26-SEP-19	R4850120
Calcium (Ca)-Total	48.8		0.050	mg/L	26-SEP-19	26-SEP-19	R4850120
Chromium (Cr)-Total	0.00117		0.00010	mg/L	26-SEP-19	26-SEP-19	R4850120
Cobalt (Co)-Total	0.00111		0.00010	mg/L	26-SEP-19	26-SEP-19	R4850120
Copper (Cu)-Total	<0.00050		0.00050	mg/L	26-SEP-19	26-SEP-19	R4850120
Iron (Fe)-Total	18.7		0.010	mg/L	26-SEP-19	26-SEP-19	R4850120
Lead (Pb)-Total	0.000126		0.000050	mg/L	26-SEP-19	26-SEP-19	R4850120
Magnesium (Mg)-Total	14.1		0.0050	mg/L	26-SEP-19	26-SEP-19	R4850120
Manganese (Mn)-Total	1.80		0.0010	mg/L	26-SEP-19	04-OCT-19	R4861414
Nickel (Ni)-Total	0.00108		0.00050	mg/L	26-SEP-19	26-SEP-19	R4850120
Potassium (K)-Total	6.84		0.050	mg/L	26-SEP-19	26-SEP-19	R4850120
Sodium (Na)-Total	83.2		0.050	mg/L	26-SEP-19	26-SEP-19	R4850120
Zinc (Zn)-Total	0.0049		0.0030	mg/L	26-SEP-19	26-SEP-19	R4850120
Total Organic Carbon by Combustion							
Total Organic Carbon	9.59		0.50	mg/L		26-SEP-19	R4849225
Total Suspended Solids							
Total Suspended Solids	43.9		2.0	mg/L		27-SEP-19	R4849648
pH							
pH	7.16		0.10	pH units		24-SEP-19	R4838730

* 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).
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-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.			
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.			
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.			

Reference Information

Test Method References:

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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:

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.

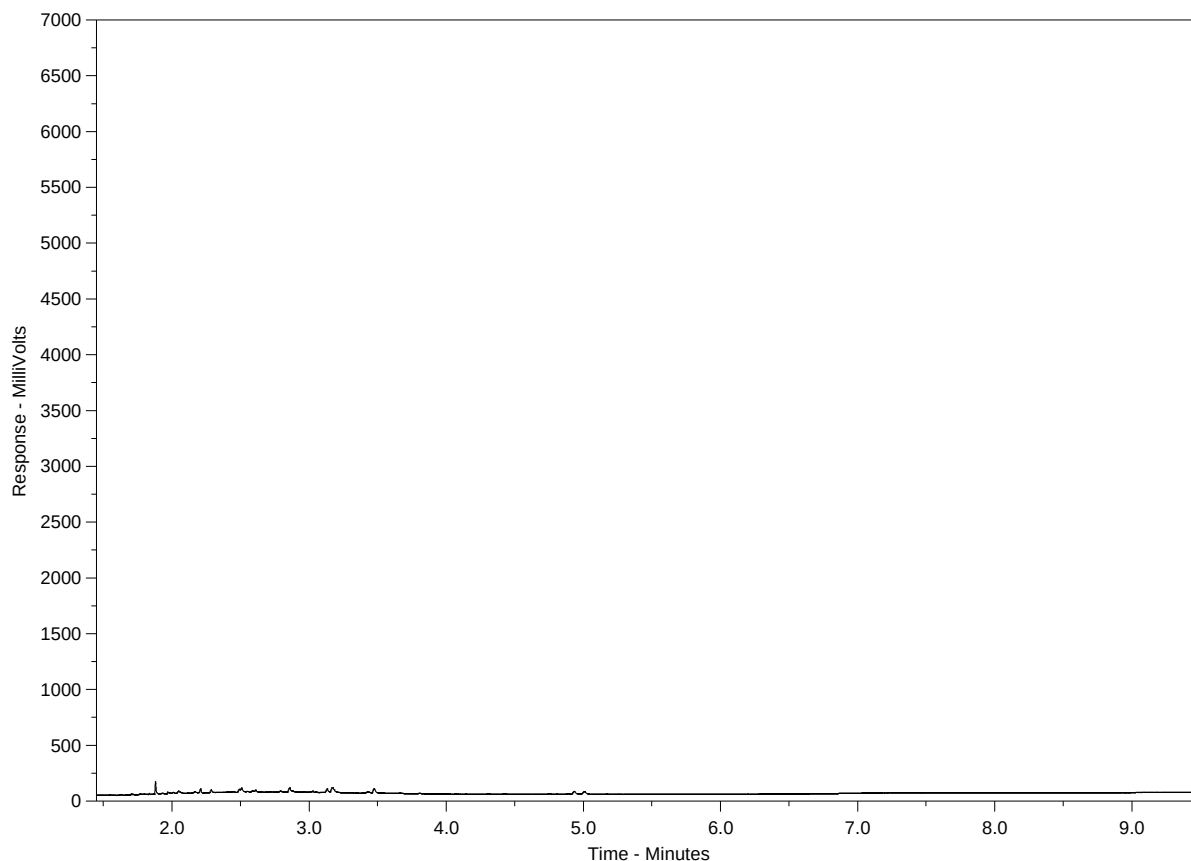
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

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

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2351932-1
Client Sample ID: ARV-2



← 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.

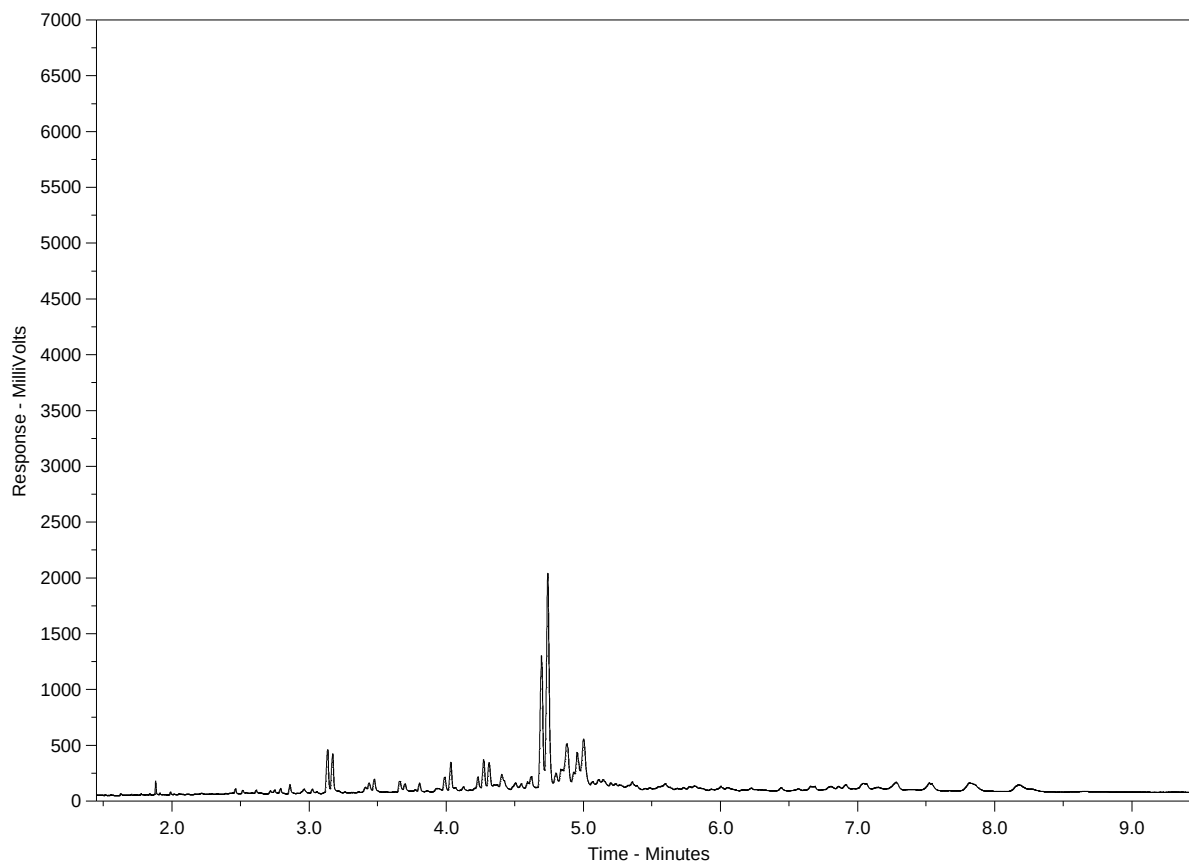
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2351932-2
Client Sample ID: ARV-4



← 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.

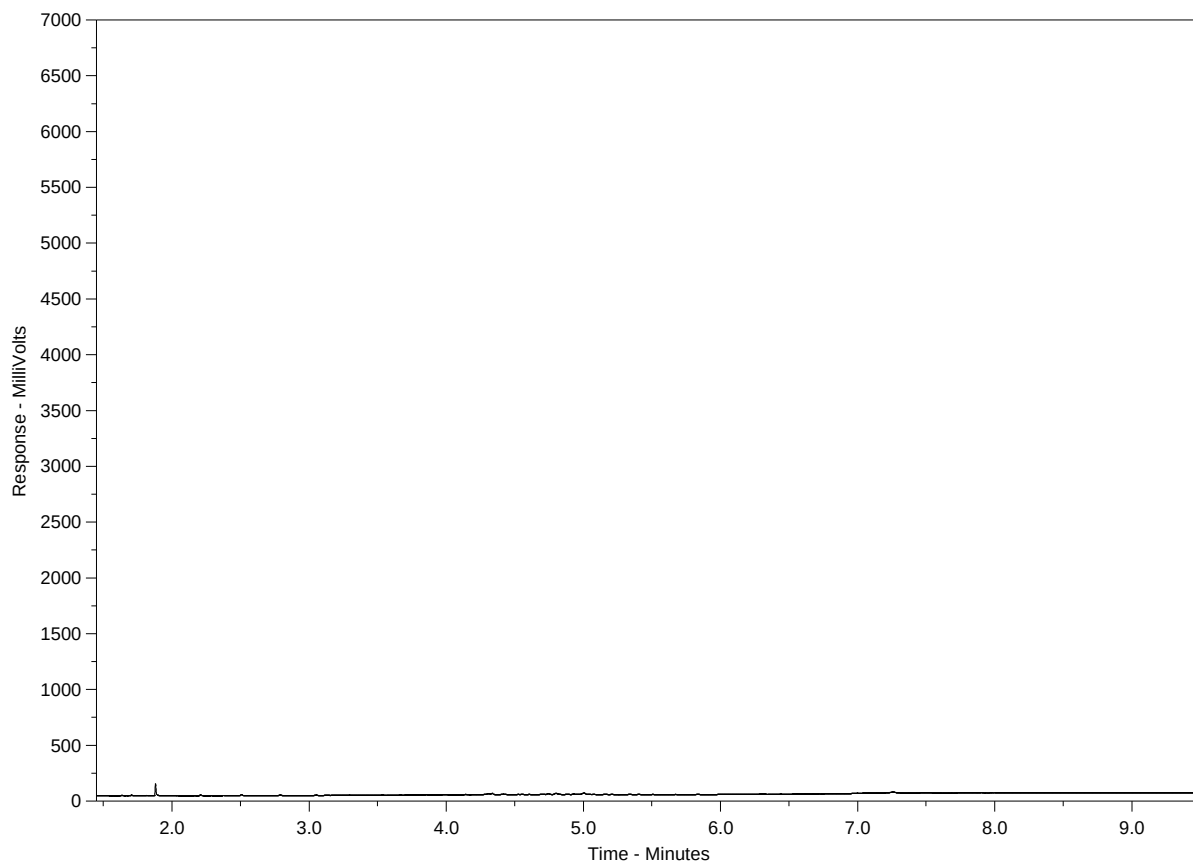
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2351932-3
Client Sample ID: ARV-5



← 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.

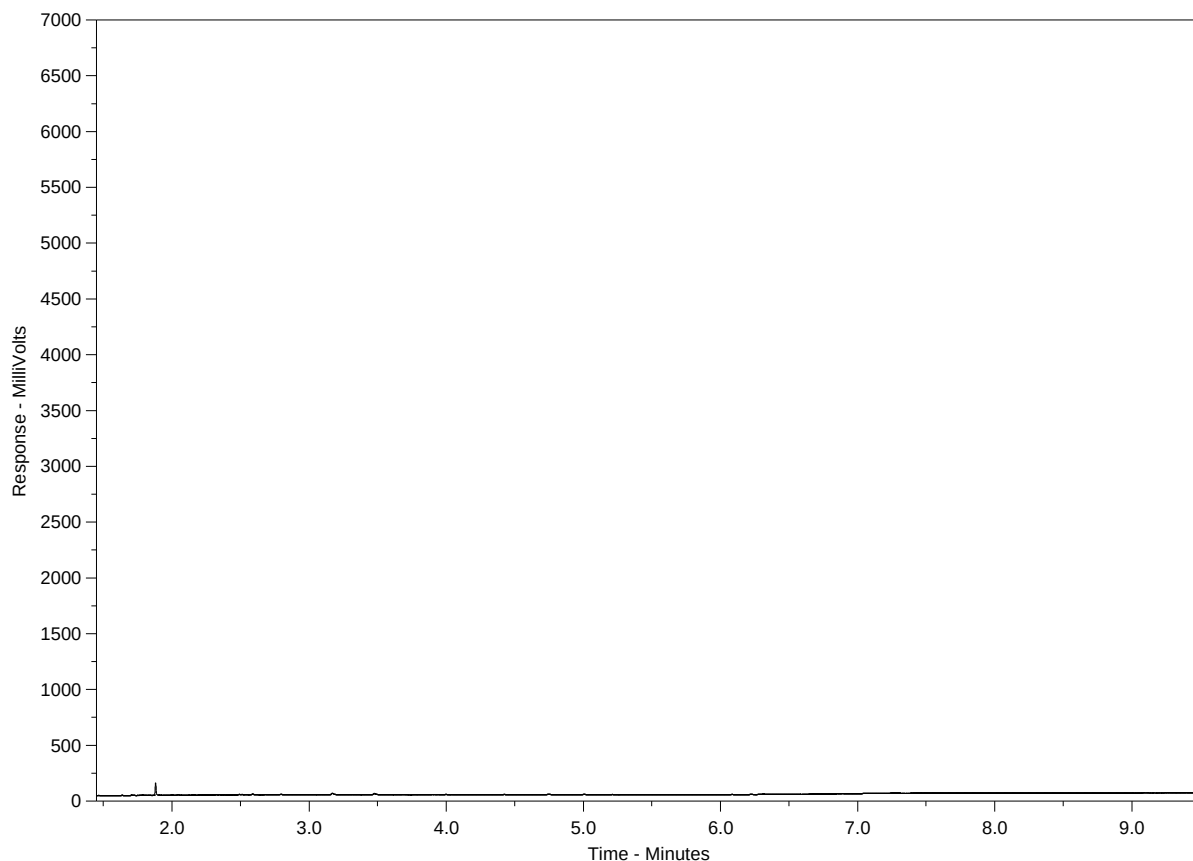
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor, and the scale at left.

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.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2351932-4
Client Sample ID: ARV-6



← 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.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com



L2351932-COFC

COC Number: 17 - 747862

Page 1 of 1

Report To		Report Format / L		Contact your AM to confirm all E&P TATs (surcharges may apply)	
Company:	Humbly of ARVIAT	Select Report Format:	☐ PDF ☐ EXCEL ☒ EDD (DIGITAL)	TAT if received by 3 pm - business days - no surcharges apply	
Contact:	Steve Englebert	Quality Control (QC) Report with Report	☐ YES ☒ NO	1 Business day [E - 100%]	
Phone:	867-857-7841	☐ Compare Results to Criteria on Report - provide details below if box checked		Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)]	
Company address below will appear on the final report		Select Distribution:	☐ EMAIL ☐ MAIL ☐ FAX		
Street:		Email 1 or Fax	Sao@arvial.ca	Date and Time Required for all E&P TATs: dd-mm-yy hh:mm	
City/Province:	ARVIAT NUNAVUT	Email 2	Scollins@gov.nu.ca	For tests that can not be performed according to the service level selected, you will be contacted.	
Postal Code:	X0C-0E0	Email 3		Analysis Request	
Invoice To	Same as Report To ☒ YES ☐ NO	Invoice Distribution		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below	
Copy of Invoice with Report	☐ YES ☒ NO	Select Invoice Distribution:	☐ EMAIL ☐ MAIL ☐ FAX		
Company:		Email 1 or Fax			
Contact:		Email 2			
Project Information		Oil and Gas Required Fields (client use)			
ALS Account # / Quote #:		AFE/Cost Center:	PO#		
Job #:		Major/Minor Code:	Routing Code:		
PO / AFE:		Requisitioner:			
LSD:		Location:			
ALS Lab Work Order # (lab use only):		ALS Contact:	Sampler:		
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	
	ARV-2	09-20-19	8:46am		
	ARV-4	09-20-19	8:26am		
	ARV-5	09-20-19	9:15am		
	ARV-6	09-20-19	9:32am		
Drinking Water (DW) Samples (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)		SAMPLE CONDITION AS RECEIVED (lab use only)	
Are samples taken from a Regulated DW System?				Frozen ☐ SIF Observations Yes ☐ No ☐	
☐ YES ☐ NO				Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐	
Are samples for human consumption/ use?				Cooling Initiated ☐	
☐ YES ☐ NO				INITIAL COOLER TEMPERATURES °C: 4.9°C	
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)		FINAL SHIPMENT RECEPTION (lab use only)	
Released by:	Date:	Received by:	Date:	Received by:	Date:
Carla	Sept 20/19	MM	21-Sep-19		

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY

YELLOW - CLIENT COPY

JUNE 2018 FROM

**ANNUAL REPORT
FOR THE HAMLET OF ARVIAT**

Appendix D

Spills

Occurance Date

Start date

Jan 1 2019

End date

Dec 31 2019

Spill Location

--Arviat

Spill Location Description

Report Number

Items per page

10

Go

Reset

Spill Region

- Any -



Spill	Occurance Date	Spill Region	Location	Location Description	Product Spilled	Quantity	Measurement	Spill Cause	Lead Agency
spill-2019329	August 20, 2019	Keewatin	Arviat, Community, Nunavut	Arviat Power Plant	Petroleum - lubricating oil (lube, hydraulic)	400.00	Litres	Breakage	GN - Government of Nunavut
spill-2019237	June 7, 2019		Arviat, Community, Nunavut	300 7th Avenue, Arviat, NU	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	Unknown Quantity			GN - Government of Nunavut
spill-2019182	May 2, 2019	Keewatin	Arviat, Community, Nunavut	400 10th Avenue	Petroleum - fuel oil (jet A, diesel, turbo A, heat)	1620.00	Litres	Tank Leak	GN - Government of Nunavut

**ANNUAL REPORT
FOR THE HAMLET OF ARVIAT**

Appendix E

Arviat ARV-2a																								
			2014			2015				2016				2017				2019				Statistics		
Parameter	Unit	DL	15-Jul-14	01-Aug-14	12-Sep-14	15-Jun-15	21-Jul-15	18-Aug-15	16-Sep-15	22-Jun-16	12-Jul-16	25-Aug-16	16-Sep-16	19-Jun-17	12-Jul-17	10-Aug-17	19-Sep-17	13-Jun-19	17-Jul-19	26-Aug-19	20-Sep-19	Min	Max	Average
Alkalinity																								
Bicarbonate (HCO3)	mg/L	1.2	800	/	628	/	934	722	634	490	429	537	704	243	356	366	776	160	537	699	786	160	934	560.29
Carbonate (CO3)	mg/L	0.60	12	/	12	/	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.6	12	1.69
Hydroxide (OH)	mg/L	0.34	6.8	/	6.8	/	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	6.8	0.96
Total (as CaCO3)	mg/L	1.0	656	/	515	/	766	592	520	401	352	440	577	199	292	300	636	132	440	573	645	132	766	459.33
Ammonia by Colour																								
Total (as N)	mg/L	0.010	12.0	12.1	5.6	0.119	14.0	8.6	5.6	9.2	6.16	5.0	15.2	0.90	2.85	2.75	9.00	2.24	4.72	0.484	13.10	0.12	15.2	6.77
Biochemical Oxygen Demand (BOD)																								
Biochemical Oxygen Demand	mg/L	20	37.4	37.2	41.2	2.2	79	34.1	17.8	20.3	31.8	28.1	18.1	51	35.2	38	23.8	10.4	31.5	13.6	9	2.2	79.0	28.80
Carbonaceous BOD																								
BOD Carbonaceous	mg/L	20	34.1	/	20.0	/	40	14.6	9.9	17.5	21.4	25.9	15.7	46	21.2	29.5	17.1	8.2	16.6	9.6	6	6.0	46.0	21.69
Chloride in Water by IC																								
Chloride (Cl)	mg/L	10	291	/	301	/	409	380	408	414	450	399	371	422	836	869	430	142	49	317	415	49	869	445.14
Conductivity																								
Conductivity	umhos/cm	1.0	2530	2990	2330	272	3340	2910	2720	2460	2670	2790	2760	1920	3310	3500	2410	1030	2930	2910	3110	272	3820	2709.65
Fecal Coliforms																								
Fecal Coliforms	MPN/100mL	3	24000	150	23	4	36	15	9	110	23	3	9	50	10	130	20	230	60	360	60	3	24000	1133.13
Hardness Calculated																								
Hardness (as CaCO3)	mg/L	0.30	997	/	954	/	1160	1000	831	726	791	994	1040	520	839	1010	1130	289	841	1030	1310	289	1310	922.38
Mercury Total																								
Mercury (Hg)	mg/L	0.000200	0.000027	0.00020	0.00020	0.000020	0.00020	0.00020	0.00020	0.000029	0.000020	0.000020	0.000020	0.0000122	0.0000050	0.0000050	0.0000057	0.0000060	0.0000190	0.0000150	0.0000090	0.000005	0.0002	0.0000558
Nitrate in Water by IC																								
Nitrate (as N)	mg/L	0.020	0.25	/	0.31	0.267	0.40	0.10	0.381	0.20	0.40	0.40	0.40	0.25	0.40	0.40	0.20	0.50	0.40	0.020	0.40	0.020	0.501	0.317
Nitrate + Nitrite																								
Nitrate and Nitrite as N	mg/L	0.070	0.35	0.35	0.35	0.267	0.45	0.11	0.479	0.22	0.45	0.45	0.45	0.25	0.45	0.45	0.22	0.53	0.45	0.07	0.45	0.07	0.534	0.36
Nitrite in Water by IC																								
Nitrite (as N)	mg/L	0.010	0.25	/	0.25	0.010	0.20	0.050	0.098	0.10	0.20	0.20	0.20	0.10	0.27	0.20	0.10	0.03	0.20	0.01	0.20	0.01	0.27	0.15
Oil & Grease - Gravimetric																								
Oil and Grease	mg/L	2.00	/	5.7	2.0	2.0	4.5	2.0	2.0	5.0	5.0	5.0	5.0	5.0	11.0	5.0	5.0	5.0	5.0	5.0	5.0	2	11	4.74
Phenol																								
Phenols	mg/L	0.0010	0.0055	0.0106	0.010	0.0010	0.0295	0.0049	0.0061	0.0083	0.0043	0.0074	0.0063	0.0041	0.0021	0.0016	0.0042	0.0016	0.0056	0.0367	0.0029	0.001	0.0367	0.0073
Phosphorus, Total																								
Phosphorus (P)	mg/L	0.10	2.21	/	0.700	0.10	1.65	0.907	0.756	1.09	0.704	0.746	1.06	0.71	0.665	0.694	1.01	0.32	0.411	0.587	0.538	0.100	2.210	0.780
Sulfate in Water by IC																								
Sulfate (SO4)	mg/L	0.30	419	466	490	50.1	469	539	466	297	445	501	515	322	431	565	536	164	81.5	669	803	50.1	803	450.33
Total Metals by ICP-MS																								
Aluminium (Al)	mg/L	0.0050	0.305	/	0.050	0.0689	0.0934	0.0195	0.0105	0.0353	0.0425	0.0216	0.0264	0.0252	0.0283	0.0203	0.0147	0.068	0.0228	0.0193	0.0125	0.0088	0.3050	0.0443
Arsenic (As)	mg/L	0.00020	0.00743	0.00651	0.0061	0.00038	0.00631	0.00766	0.00843	0.00396	0.00459	0.00596	0.00584	0.00403	0.00541	0.00753	0.00853	0.00223	0.00490	0.00473	0.00750	0.00038	0.00853	0.00566
Cadmium (Cd)	mg/L	0.000010	0.000336	0.000074	0.00010	0.000010	0.000199	0.000068	0.000023	0.000258	0.000082	0.000061	0.000077	0.000154	0.0000342	0.0000104	0.0000912	0.0000929	0.000179	0.000223	0.0000530	0.000010	0.000606	0.000121
Calcium (Ca)	mg/L	0.10	323	356	298	36.1	353	307	245	217	217	297	325	133	181	238	343	82.4	232	312	396	36.1	396	257.41
Chromium (Cr)	mg/L	0.0010	0.0045	0.0022	0.010	0.0010	0.0027	0.0014	0.0010	0.0015	0.0018	0.0010	0.0010	0.0010	0.00096	0.00093	0.00127	0.00045	0.00142	0.00096	0.00093	0.00045	0.01000	0.00180
Cobalt (Co)	mg/L	0.00020	0.00396	/	0.0020	0.00047	0.00167	0.00136	0.00094	0.00202	0.00128	0.00096	0.00087	0.00173	0.00110	0.00095	0.00098	0.00098	0.00183	0.00138	0.00104	0.00047	0.00396	0.00144
Copper (Cu)	mg/L	0.00020																						

Arviat ARV-4																								
			2014			2015				2016				2017				2019				Statistics		
Parameter	Unit	DL	15-Jul-14	03-Aug-14	12-Sep-14	15-Jun-15	21-Jul-15	18-Aug-15	16-Sep-15	22-Jun-16	12-Jul-16	25-Aug-16	16-Sep-16	19-Jun-17	12-Jul-17	10-Aug-17	19-Sep-17	13-Jun-19	17-Jul-19	26-Aug-19	20-Sep-19	Min	Max	Average
Alkalinity																								
Bicarbonate (HCO3)	mg/L	1.2	332	/	82	/	205	202	227	203	238	206	192	224	354	168	236	159	340	208	86.6	82	354	217
Carbonate (CO3)	mg/L	0.60	12	/	12	/	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	13.2	0.6	0.60	0.60	2.76	24.00	0.60	24.00	3.50
Hydroxide (OH)	mg/L	0.34	6.80	/	6.80	/	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	6.80	0.97
Total (as CaCO3)	mg/L	1.0	272	/	67	/	168	166	186	167	195	169	157	183	290	159	194	131	279	175	111	67.00	290.00	181.43
Ammonia by Colour																								
Total (as N)	mg/L	0.20	39.9	9.4	12.5	37.8	13.6	14.8	15.6	17.0	25.2	17.0	16.7	19.1	27.9	8.68	19.40	19.6	65.9	28.0	5.95	5.95	65.90	22.07
Biochemical Oxygen Demand (BOD)																								
Biochemical Oxygen Demand	mg/L	20	28.4	50.1	69.1	67	30.2	112	7.7	15.4	34.6	6.0	6.3	27.2	215	50	5.6	22.4	65	27.1	51	5.60	215.00	43.11
Carbonaceous BOD																								
BOD Carbonaceous	mg/L	20	17.0	/	40.2	/	16.1	77	2.0	14.0	20.6	2.4	3.5	21.9	154	43	2.2	12.6	58	18.2	25.4	2.00	154.00	28.09
Chloride in Water by IC																								
Chloride (Cl)	mg/L	10	83.5	/	183	/	161	233	300	188	291	381	318	146	167	146	517	154	73.8	84.9	87.8	73.80	517.00	225.95
Conductivity																								
Conductivity	umhos/cm	1.0	868	570	750	809	903	1100	1350	968	1370	1640	1360	817	1090	761	1830	832	856	647	477	477.00	1880.00	1067.39
Fecal Coliforms																								
Fecal Coliforms	MPN/100mL	3	9300	4	640	24000	930	300	150	93	430	93	240	990	2050	230	190	19900	24200	5790	3870	4.00	24200.00	5610.00
Hardness Calculated																								
Hardness (as CaCO3)	mg/L	0.30	88.2	/	81.2	/	114	158	187	124	174	204	142	87.6	117	93.7	254	98.8	58.0	54.6	61.2	54.60	254.00	133.10
Mercury Total																								
Mercury (Hg)	mg/L	0.00020	0.000020	0.0002	0.00020	0.00020	0.00040	0.00020	0.00020	0.000020	0.00020	0.000020	0.000020	0.0000052	0.0000050	0.000050	0.000005	0.0000100	0.0000050	0.0000050	0.0000050	0.0000050	0.0004000	0.0000790
Nitrate in Water by IC																								
Nitrate (as N)	mg/L	0.020	0.502	/	0.563	0.049	0.040	0.378	0.569	0.10	0.10	0.41	0.48	0.494	0.040	0.020	1.940	0.17	0.020	0.372	0.455	0.020	1.940	0.348
Nitrate + Nitrite																								
Nitrate and Nitrite as N	mg/L	0.070	0.868	1.44	0.859	0.070	0.070	0.416	0.594	0.11	0.11	0.47	0.48	0.540	0.070	0.182	2.15	0.173	0.070	0.548	0.833	0.070	2.150	0.484
Nitrite in Water by IC																								
Nitrite (as N)	mg/L	0.010	0.367	/	0.296	0.015	0.020	0.037	0.025	0.050	0.050	0.061	0.050	0.047	0.020	0.182	0.21	0.020	0.010	0.18	0.378	0.010	0.378	0.106
Oil & Grease - Gravimetric																								
Oil and Grease	mg/L	2.0	0.0350	2.0	2.0	2.0	2.0	18.5	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.5	5.0	11.7	5.0	5.0	0.04	18.50	5.06
Phenol																								
Phenols	mg/L	0.0010	0.0350	0.0050	0.0010	0.0018	0.0054	0.0031	0.0040	0.0015	0.0018	0.0052	0.0045	0.0040	0.022	0.010	0.003	0.0072	0.197	0.010	0.0065	0.001	0.197	0.015
Phosphorus, Total																								
Phosphorus (P)	mg/L	0.10	9.55	/	6.00	5.63	6.60	3.32	4.81	5.15	4.60	4.12	2.18	3.91	6.88	8.65	0.92	4.36	9.46	6.18	6.64	0.92	22.40	6.64
Sulfate in Water by IC																								
Sulfate (SO4)	mg/L	6.0	5.15	2.18	4.98	8.97	5.60	10.40	27.2	7.2	14.6	21.6	26.7	8.78	3.87	18.6	66	22	3.54	10.2	8.94	2.18	66.00	15.79
Total Metals by ICP-MS																								
Aluminium (Al)	mg/L	0.0050	0.169	/	0.211	0.0934	0.128	1.18	0.255	0.0818	0.138	0.0436	0.0375	0.104	1.26	0.344	0.0259	0.113	0.148	0.119	0.191	0.026	1.260	0.229
Arsenic (As)	mg/L	0.00020	0.00627	0.00844	0.00789	0.00433	0.00523	0.00870	0.00725	0.00647	0.00665	0.00443	0.00364	0.00590	0.0101	0.0110	0.0034	0.00491	0.0042	0.00585	0.00672	0.00335	0.01100	0.00646
Cadmium (Cd)	mg/L	0.000010	0.000070	0.000079	0.000088	0.000147	0.000048	0.000214	0.000073	0.000027	0.000059	0.000010	0.000014	0.000052	0.000266	0.0000669	0.0000191	0.000132	0.0000898	0.0000653	0.0000711	0.0000092	0.0006100	0.0000989
Calcium (Ca)	mg/L	0.10	20.7	17	16.6	18.5	20.8	27.9	36.6	23.1	31.5	36.0	23.9	15.8	22.1	18.3	44.1	17.2	13.6	10.8	11.9	10.80	44.10	23.45
Chromium (Cr)	mg/L	0.0010	0.0013	/	0.0013	0.0011	0.0010	0.0037	0.0013	0.0010	0.0010	0.0010	0.0010	0.0010	0.0047	0.00165	0.00038	0.00070	0.00108	0.00111	0.00142	0.00038	0.00470	0.00149
Cobalt (Co)	mg/L	0.00020	0.00234	/	0.00204	0.00323	0.00231	0.00423	0.00230	0.00286	0.00286	0.00255	0.00118	0.00256	0.0047									

Arviat ARV-5																								
			2014			2015				2016				2017				2019				Statistics		
Parameter	Unit	DL	15-Jul-14	01-Aug-14	12-Sep-14	15-Jun-15	21-Jul-15	18-Aug-15	16-Sep-15	22-Jun-16	12-Jul-16	25-Aug-16	16-Sep-16	19-Jun-17	12-Jul-17	10-Aug-17	19-Sep-17	13-Jun-19	17-Jul-19	26-Aug-19	20-Sep-19	Min	Max	Average
Alkalinity																								
Bicarbonate (HCO3)	mg/L	1.2	50	/	93	/	93.9	133	87.0	38.4	73.2	107	78.2	78.7	135	135	42.5	64.7	92.2	78.2	76	38.4	135.0	85.1
Carbonate (CO3)	mg/L	0.60	12.00	/	12.00	/	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	12.00	1.69
Hydroxide (OH)	mg/L	0.34	6.80	/	6.80	/	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	6.80	0.96
Total (as CaCO3)	mg/L	1.0	41	/	76	/	77.0	109	71.3	31.5	60.0	87.7	64.1	64.5	110	110	34.8	53.0	75.6	64.1	62.3	31.50	110.00	69.64
Ammonia by Colour																								
Total (as N)	mg/L	0.20	0.085	0.01	0.01	0.015	0.021	0.037	0.020	0.01	0.029	0.013	0.054	0.020	0.025	0.025	0.010	0.015	0.057	0.014	0.02	0.010	0.085	0.025
Biochemical Oxygen Demand (BOD)																								
Biochemical Oxygen Demand	mg/L	6.0	6.0	6.0	6.0	2.0	2.0	2.0	2.0	2.3	3.1	2.0	3.0	2.0	2.0	2.3	2	2.0	2	2	2	2.00	6.00	2.65
Carbonaceous BOD																								
BOD Carbonaceous	mg/L	6.0	6.0	/	6.0	/	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2	2	6	2.00	6.00	2.62
Chloride in Water by IC																								
Chloride (Cl)	mg/L	10	513	/	311	/	901	517	361	94.5	846	290	185	746	1300	868	277	164	200	173	176	94.50	1300.00	434.55
Conductivity																								
Conductivity	umhos/cm	1.0	1730	2700	1100	305	2990	1920	1280	386	2670	1130	735	2200	3890	2790	1010	679	834	699	676	305	3890	1484
Fecal Coliforms																								
Fecal Coliforms	MPN/100mL	3	9	43	3	4	4	7500	4	3	3	15	43	10	10	60	10	500	10	30	10	3.00	7500.00	363.52
Hardness Calculated																								
Hardness (as CaCO3)	mg/L	0.30	373	/	162	/	466	273.00	214	64.3	399	185	120	390	744	412	204	109	133	112	109	64	744	244
Mercury Total																								
Mercury (Hg)	mg/L	0.00020	0.000020	0.00020	0.000024	0.000020	0.000020	0.00020	0.00020	0.000020	0.000020	0.000020	0.000020	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0000050	0.0002000	0.0000358
Nitrate in Water by IC																								
Nitrate (as N)	mg/L	0.020	0.25	/	0.050	0.020	0.40	0.10	0.020	0.020	0.40	0.040	0.020	0.20	0.40	0.20	0.04	0.020	0.020	0.020	0.020	0.020	0.400	0.114
Nitrate + Nitrite																								
Nitrate and Nitrite as N	mg/L	0.070	0.35	0.35	0.071	0.070	0.45	0.11	0.070	0.070	0.45	0.070	0.070	0.22	0.45	0.22	0.07	0.070	0.070	0.070	0.070	0.070	0.450	0.162
Nitrite in Water by IC																								
Nitrite (as N)	mg/L	0.010	0.25	/	0.050	0.010	0.20	0.050	0.010	0.010	0.20	0.020	0.010	0.10	0.20	0.10	0.02	0.010	0.010	0.010	0.010	0.010	0.250	0.064
Oil & Grease - Gravimetric																								
Oil and Grease	mg/L	5.0	/	2.0	2.0	2.0	2.0	2.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.9	5.0	5.0	5.0	2.0	10.9	4.5
Phenol																								
Phenols	mg/L	0.0010	0.0010	0.0010	0.0010	0.0010	0.0138	0.0027	0.0013	0.001	0.0038	0.0033	0.0014	0.0033	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0138	0.0020
Phosphorus, Total																								
Phosphorus (P)	mg/L	0.010	0.028	/	0.050	0.10	0.044	0.043	0.034	0.06	0.170	0.045	0.137	0.0038	0.043	0.135	0.013	0.0290	0.0353	0.0179	0.0190	0.0038	0.1700	0.0498
Sulfate in Water by IC																								
Sulfate (SO4)	mg/L	6.0	30.5	16	8.42	7.18	53.0	10.0	7.13	7.51	30.4	4.90	11.8	14.4	119	39.7	80.1	16.7	10.9	12.3	12.1	2.80	119.00	22.81
Total Metals by ICP-MS																								
Aluminium (Al)	mg/L	0.0050	0.282	/	0.0319	0.0124	0.0779	0.0536	0.0471	0.352	0.463	0.326	0.0237	0.0576	0.0220	0.0744	0.0096	0.0254	0.026	0.0126	0.0196	0.009	0.463	0.091
Arsenic (As)	mg/L	0.00020	0.00051	0.00087	0.00047	0.00020	0.00050	0.00076	0.00057	0.00051	0.00085	0.00062	0.00036	0.00068	0.00050	0.00090	0.00029	0.00043	0.00062	0.00038	0.00040	0.00020	0.00090	0.00056
Cadmium (Cd)	mg/L	0.000010	0.000074	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000010	0.000016	0.000010	0.000010	0.000010	0.0000050	0.0000050	0.0000050	0.0000050	0.0000093	0.0000075	0.0000050	0.0000050	0.0000740	0.0000109
Calcium (Ca)	mg/L	0.10	78	53.4	28.9	8.98	47.2	37.7	39.5	11.7	47.0	35.0	22.5	40.6	79.9	55.1	40.6	19.4	24.5	22.2	19.8	8.98	79.90	35.61
Chromium (Cr)	mg/L	0.0010	0.0016	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0014	0.0010	0.0010	0.0010	0.00022	0.00047	0.00014	0.00025	0.00030	0.00026	0.00018	0.00014	0.00160	0.00068
Cobalt (Co)	mg/L	0.00020	0.00021	/	0.00020	0.00020	0.00020	0.00033	0.00020	0.00040	0.00057	0.00035	0.00020	0.00030	0.00021	0.00023	0.0001	0.00010	0.00015	0.00010	0.00010	0.00010	0.00057	

Arviat ARV-6																								
Parameter	Unit	DL	2014			2015				2016				2017				2019				Statistics		
			15-Jul-14	01-Aug-14	12-Sep-14	15-Jun-15	21-Jul-15	18-Aug-15	16-Sep-15	22-Jun-16	12-Jul-16	25-Aug-16	16-Sep-16	19-Jun-17	12-Jul-17	10-Aug-17	19-Sep-17	13-Jun-19	17-Jul-19	26-Aug-19	20-Sep-19	Min	Max	Average
Alkalinity																								
Bicarbonate (HCO3)	mg/L	1.2	90	/	126	/	138	128	118	31.0	112	118	97.7	76.9	94.6	/	/	/	127	102	115	31.00	138.00	104.68
Carbonate (CO3)	mg/L	0.60	12	/	12	/	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	/	/	/	0.60	0.60	0.60	0.60	12.00	1.87
Hydroxide (OH)	mg/L	0.34	6.8	/	6.8	/	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	/	/	/	0.34	0.34	0.34	0.34	6.80	1.06
Total (as CaCO3)	mg/L	1.0	74	/	103	/	113	105	96.8	25.4	91.5	97.0	80.1	63.0	77.5	/	/	/	104	83.2	94.4	25.40	113.00	85.75
Ammonia by Colour																								
Total (as N)	mg/L	0.20	0.010	0.289	0.075	/	0.256	0.330	0.435	0.010	0.452	0.138	0.83	0.070	0.251	/	/	/	0.100	0.117	0.145	0.01	0.83	0.23
Biochemical Oxygen Demand (BOD)																								
Biochemical Oxygen Demand	mg/L	6.0	6.0	29.3	6.0	70.1	6.3	8.0	6.0	3.1	7.3	5.1	5.1	8.2	2.1	/	/	/	6.0	2	6	2.00	70.10	9.91
Carbonaceous BOD																								
BOD Carbonaceous	mg/L	6.0	6.0	/	6.0	/	5.9	3.1	2.0	2.3	4.7	2.0	2.2	6.6	2.0	/	/	/	6.0	2	6	2.00	7.30	4.12
Chloride in Water by IC																								
Chloride (Cl)	mg/L	10	149	/	155	/	45.1	99.8	176	112	159	267	215	66.9	196	/	/	/	130	163	184	45.10	267.00	166.88
Conductivity																								
Conductivity	umhos/cm	1.0	655	749	669	198	691	693	712	427	685	1070	834	333	737	/	/	/	630	677	721	198.00	1070.00	698.90
Fecal Coliforms																								
Fecal Coliforms	MPN/100mL	3	3	23	3	4	3	3	430	3	3	3	3	10	10	/	/	/	10	10	10	3.00	430.00	29.05
Hardness Calculated																								
Hardness (as CaCO3)	mg/L	0.30	167	/	149	/	205	152	172	139	205	253	221	99.6	209	/	/	/	164	156	180	99.60	319.00	194.03
Mercury Total																								
Mercury (Hg)	mg/L	0.00020	0.000020	0.00020	0.000020	0.00020	0.00020	0.00020	0.00040	0.000020	0.00020	0.000020	0.000020	0.0000050	0.0000050	/	/	/	/	0.0000050	0.0000050	0.000005	0.00040	0.00008
Nitrate in Water by IC																								
Nitrate (as N)	mg/L	0.40	0.050	/	0.050	0.030	0.020	0.020	0.020	0.020	0.020	0.159	0.040	0.020	0.020	/	/	/	0.020	0.020	0.020	0.020	0.159	0.034
Nitrate + Nitrite																								
Nitrate and Nitrite as N	mg/L	0.45	0.071	0.071	0.071	0.070	0.070	0.070	0.070	0.070	0.070	0.159	0.070	0.070	0.070	/	/	/	0.070	0.070	0.070	0.070	0.159	0.075
Nitrite in Water by IC																								
Nitrite (as N)	mg/L	0.20	0.050	/	0.050	0.010	0.010	0.010	0.010	0.010	0.010	0.020	0.020	0.010	0.010	/	/	/	0.010	0.010	0.010	0.010	0.050	0.016
Oil & Grease - Gravimetric																								
Oil and Grease	mg/L	5.0	/	2.0	2.0	2.0	2.0	2.0	4.4	5.0	33.0	5.0	5.0	5.0	5.0	/	/	/	5.0	5.0	5.0	2.00	33.00	5.73
Phenol																								
Phenols	mg/L	0.0010	0.0010	0.0193	0.0013	0.0028	0.0102	0.0055	0.0027	0.0031	0.0036	0.0037	0.0030	0.0141	0.0018	/	/	/	0.0034	0.0010	0.0010	0.0010	0.019	0.005
Phosphorus, Total																								
Phosphorus (P)	mg/L	0.010	0.069	/	0.059	0.10	0.407	0.063	0.433	0.122	0.119	0.305	0.043	0.065	0.082	/	/	/	0.0560	0.0412	0.102	0.028	0.433	0.137
Sulfate in Water by IC																								
Sulfate (SO4)	mg/L	6.0	8.83	0.50	0.50	1.75	2.64	0.30	1.11	0.46	0.30	3.22	0.60	0.30	0.81	/	/	/	2.68	0.51	0.30	0.30	8.83	1.43
Total Metals by ICP-MS																								
Aluminium (Al)	mg/L	0.0050	0.237	/	0.0369	0.680	1.36	0.0310	0.627	0.120	0.995	1.69	0.0246	0.0867	0.245	/	/	/	0.0339	0.201	0.0806	0.020	1.690	0.357
Arsenic (As)	mg/L	0.00020	0.00052	0.00584	0.00081	0.00036	0.00319	0.00082	0.00137	0.00052	0.00156	0.00127	0.00101	0.00065	0.00102	/	/	/	0.00100	0.00085	0.00085	0.00036	0.00680	0.00163
Cadmium (Cd)	mg/L	0.000010	0.000019	0.000032	0.000010	0.000047	0.000020	0.000010	0.000017	0.000032	0.000089	0.000091	0.000010	0.000010	0.0000054	/	/	/	0.0000712	0.0000252	0.0000055	0.000005	0.000091	0.000028
Calcium (Ca)	mg/L	0.10	43.9	44.9	37.6	17.4	52.6	39.6	47.0	45.8	58.2	74.2	64.5	28.7	56.9	/	/	/	44.8	40.5	48.8	17.40	101.00	52.28
Chromium (Cr)	mg/L	0.0010	0.317	0.0098	0.0010	0.0010	0.0048	0.0011	0.0035	0.0010	0.0032	0.0036	0.0010	0.0010	0.00130	/	/	/	0.00044	0.00103	0.00117	0.00024	0.31700	0.01772
Cobalt (Co)	mg/L	0.00020	0.00149	/	0.00165	0.00141	0.00480	0.00238	0.00265	0.00194	0.00384	0.00361	0.00092	0.00209	0.00201	/	/	/	0.00212	0.00143	0.00111	0.0009	0.0048	0.0022
Copper (Cu)	mg/L	0.00020	0.00098	0.00561	0.00086	0.00266	0.00318	0.00033	0.00230	0.00114	0.00601	0.00403	0.00028	0.00073	0.00142	/	/	/	0.00087	0.00108	0.00050	0.0003	0.0060	0.0018
Iron (Fe)	mg/L	0.010	7.52	147	19.0	2.81	129	31.2	54.1	6.73														