ANNUAL REPORT
FOR THE HAMLET OF CHESTERFIELD INLET

YEAR BEING REPORTED: 2015

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water License No. **3BM-CHE1523** issued to the **Hamlet of Chesterfield Inlet**.

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 Station CHE-1, as well as detailed chemical, physical and biological analysis required at CHE-2, CHE-3 and CHE-4.

Month Reported	Quantity of Water Obtained from all Sources (m^3)	Quantity of Sewage Waste Discharged (Estimated, m^3)
January	1,239.78	Same
February	1,117.88	Same
March	1,196.88	Same
April	1,184.70	Same
May	1,204.74	Same
June	1,151.74	Same
July	1,242.78	Same
August	1,281.38	Same
September	1,197.99	Same
October	1,184.40	Same
November	1,234.49	Same
December	1,199.33	Same
ANNUAL TOTAL	**14,436.10**	**14,436.10**

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

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;

- No modifications and/or major maintenance work was carried out in 2015.
- Improved segregation of household hazardous waste, including batteries and propane tanks, is taking place at the solid waste site.

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

Spills:

- 2015061, 2015-02-21, Fuel Oil, 0L
- 2015274, 2015-08-25, Chesterfield Inlet, Heating Fuel, 150L

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

- No abandonment and restoration work was completed in 2015 and none is anticipated in 2016.

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;

- 3BM-CHE1013 Amendment/Renewal Application was submitted to the NWB on February 25, 2015.
- DFO Response to Water Licence 3BM-CHE1013 Chesterfield Inlet, September 11, 2014, submitted to the NWB on February 25, 2015.
- Chesterfield Inlet Sewage System Improvements, Record Drawings, October 2011, submitted to the NWB on February 25, 2015.

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

- Signage for the Monitoring Program Stations will be ordered over the winter for installation summer 2016. Pictures of the signage at Monitoring Program Stations will be included in the 2016 Annual Report.

ix. updates or revisions to the approved Operation and Maintenance Plans.

- The *Water, Sewage and Solid Waste Operations and Maintenance Manual, Chesterfield Inlet, NU* prepared by Nunami Stantec, May 2010 is currently being reviewed and an updated version of the O&M Manual will be submitted to the NWB in 2016.

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

- Renewed Licence was issued on May 15, 2015.
- The Hamlet is working with the Water Compliance Working Group to implement the Solid Waste Workplan goals.

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

- AANDC Inspection took place on July 28, 2015. See the appendix for the Inspection Report.
- The following pictures of the flow meter installed at Fish Lake on the reservoir resupply line were submitted to Atuat Shouldice of AANDC via email on August 28, 2015.

- Barrels will be palletized and capped prior to the 2016 inspection.

List of Appendixes

Appendix A: CHE-4 Effluent Quality Limits – 1 page
Appendix B: Weekly Inspections at Monitoring Program Stations – 1 page
Appendix C: Certificate of Analysis June 22, 2015 – 9 pages
Appendix D: Certificate of Analysis July 29, 2015 – 13 pages
Appendix E: Certificate of Analysis August 18, 2015 – 14 pages
Appendix F: Hazardous Materials Spill Database, Chesterfield Inlet 2015 – 1 page
Appendix G: AANDC Inspection Report – 1 page

2015 Chesterfield Inlet Monitoring Stations and Sampling Parameters Summary for Licence No. 3BM-CHE1523
Part D, Item 2; CHE-4 Effluent Quality Limits

Parameter	Maximum Concentration of any Grab Sample	CHE-4		
		22-Jun-15	29-Jul-15	18-Aug-16
BOD_5	80 mg/L	<2.0	<2.0	<2.0
Total Suspended Solids	100 mg/L	<5.0	<5.0	<5.0
Fecal Coliforms	1 x 10^4 CFU/100mL	4	<3	<3
Oil + Grease	no visible sheen	<2.0	<2.0	<2.0
pH	between 6 and 9	7.21	7.41	7.36

The samples taken at CHE-4 were below the maximum concentration of any grab sample for the effluent quality limits.

Nunavut Water Board Licence No. 3BM-CHE1013

Chesterfield Inlet, NU

Part H, Item 4: Weekly Inspections at Monitoring Program Stations, May to August

Week	Starting Date	CHE-2 Water Present (check)			CHE-4 Water Present (check)			Checked By
		Yes	No	Frozen	Yes	No	Frozen	
1	04-May-15	✓		✓		✓	✓	
2	11-May-15	✓		✓		✓	✓	
3	18-May-15	✓		✓		✓	✓	
4	25-May-15	✓	✓			✓	✓	
5	01-Jun-15	✓				✓		
6	08-Jun-15	✓			✓			
7	15-Jun-15	✓			✓			
8	22-Jun-15							
9	29-Jun-15							
10	06-Jul-15							
11	13-Jul-15							
12	20-Jul-15							
13	27-Jul-15							
14	03-Aug-15							
15	10-Aug-15							
16	17-Aug-15							
17	24-Aug-15							
18	31-Aug-15							

Monitoring Program Station Locations:

CHE-2: Runoff from Solid Waste Disposal Facilities

CHE-4: Final Discharge Point for Effluent from the wetland treatment area prior to Finger Bay

Hamlet of Chesterfield Inlet
ATTN: Greg Tanuyak
PO Box 10
Chesterfield Inlet NU X0C 0B0

Date Received: 24-JUN-15
Report Date: 23-JUL-15 13:04 (MT)
Version: FINAL

Client Phone: 867-898-9951

Certificate of Analysis

Lab Work Order #: L1632021

Project P.O. #: NOT SUBMITTED
Job Reference: CHESTERFIELD INLET - WASTEWATER
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1632021-1 CHE-2 (CHE-1)							
Sampled By: CLIENT on 22-JUN-15 @ 14:45							
Matrix: wastewater							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	413		1.2	mg/L		08-JUL-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		08-JUL-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		08-JUL-15	
Ammonia by colour							
Ammonia, Total (as N)	61.7	DLA	5.0	mg/L		27-JUN-15	R3215576
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	257	DLA	50	mg/L		25-JUN-15	R3222060
Carbonaceous BOD							
BOD Carbonaceous	231	DLA	50	mg/L		25-JUN-15	R3222060
Chloride in Water by IC							
Chloride (Cl)	70.1		0.50	mg/L		25-JUN-15	R3218134
Conductivity							
Conductivity	946		1.0	umhos/cm		07-JUL-15	R3221667
Fecal Coliform							
Fecal Coliforms	>110000	PEHT	3	MPN/100mL		24-JUN-15	R3218078
Hardness Calculated							
Hardness (as CaCO3)	56.5		0.30	mg/L		06-JUL-15	
Mercury Total							
Mercury (Hg)-Total	<0.00020	DLM	0.00020	mg/L	29-JUN-15	29-JUN-15	R3217526
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		25-JUN-15	R3218134
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		02-JUL-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		25-JUN-15	R3218134
Oil and Grease, Total							
Oil and Grease, Total	52.4		2.0	mg/L	02-JUL-15	02-JUL-15	R3219466
Phenol (4AAP)							
Phenols (4AAP)	0.158	DLA	0.050	mg/L		04-JUL-15	R3220221
Phosphorus, Total							
Phosphorus (P)-Total	12.1	DLA	0.20	mg/L		27-JUN-15	R3216331
Sulfate in Water by IC							
Sulfate (SO4)	12.9		0.30	mg/L		25-JUN-15	R3218134
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	339		1.0	mg/L		07-JUL-15	R3221667
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.249		0.0050	mg/L	02-JUL-15	03-JUL-15	R3219930
Arsenic (As)-Total	0.00064		0.00020	mg/L	02-JUL-15	03-JUL-15	R3219930
Cadmium (Cd)-Total	0.000194		0.000010	mg/L	02-JUL-15	03-JUL-15	R3219930
Calcium (Ca)-Total	14.4		0.10	mg/L	02-JUL-15	03-JUL-15	R3219930
Chromium (Cr)-Total	0.0013		0.0010	mg/L	02-JUL-15	03-JUL-15	R3219930
Cobalt (Co)-Total	0.00060		0.00020	mg/L	02-JUL-15	03-JUL-15	R3219930
Copper (Cu)-Total	0.150		0.00020	mg/L	02-JUL-15	03-JUL-15	R3219930
Iron (Fe)-Total	0.90		0.10	mg/L	02-JUL-15	03-JUL-15	R3219930
Lead (Pb)-Total	0.00339		0.000090	mg/L	02-JUL-15	03-JUL-15	R3219930
Magnesium (Mg)-Total	5.01		0.010	mg/L	02-JUL-15	03-JUL-15	R3219930
Manganese (Mn)-Total	0.0483		0.00030	mg/L	02-JUL-15	03-JUL-15	R3219930
Nickel (Ni)-Total	0.0038		0.0020	mg/L	02-JUL-15	03-JUL-15	R3219930

* 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
L1632021-1 CHE-2 (CHE-1)							
Sampled By: CLIENT on 22-JUN-15 @ 14:45							
Matrix: wastewater							
Total Metals by ICP-MS							
Potassium (K)-Total	24.4		0.020	mg/L	02-JUL-15	03-JUL-15	R3219930
Sodium (Na)-Total	53.4		0.030	mg/L	02-JUL-15	03-JUL-15	R3219930
Zinc (Zn)-Total	0.166		0.0020	mg/L	02-JUL-15	03-JUL-15	R3219930
Total Organic Carbon							
Total Organic Carbon	160		1.0	mg/L		22-JUL-15	R3231067
Total Suspended Solids							
Total Suspended Solids	132		5.0	mg/L		29-JUN-15	R3217556
pH							
pH	6.93		0.10	pH units		07-JUL-15	R3221667
L1632021-2 CHE-3 (CHE-2)							
Sampled By: CLIENT on 22-JUN-15 @ 15:00							
Matrix: wastewater							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	139		1.2	mg/L		08-JUL-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		08-JUL-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		08-JUL-15	
Ammonia by colour							
Ammonia, Total (as N)	0.051		0.010	mg/L		24-JUN-15	R3215314
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		25-JUN-15	R3222060
Carbonaceous BOD							
BOD Carbonaceous	2.9		2.0	mg/L		25-JUN-15	R3222060
Chloride in Water by IC							
Chloride (Cl)	96.4		0.50	mg/L		25-JUN-15	R3218134
Conductivity							
Conductivity	1450		1.0	umhos/cm		07-JUL-15	R3221667
Fecal Coliform							
Fecal Coliforms	3	PEHT	3	MPN/100mL		24-JUN-15	R3218078
Hardness Calculated							
Hardness (as CaCO3)	674		0.30	mg/L		06-JUL-15	
Mercury Total							
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	29-JUN-15	29-JUN-15	R3217526
Nitrate in Water by IC							
Nitrate (as N)	0.277		0.020	mg/L		25-JUN-15	R3218134
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.277		0.070	mg/L		02-JUL-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		25-JUN-15	R3218134
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	02-JUL-15	02-JUL-15	R3219466
Phenol (4AAP)							
Phenols (4AAP)	0.0019		0.0010	mg/L		04-JUL-15	R3220221
Phosphorus, Total							
Phosphorus (P)-Total	0.055		0.010	mg/L		27-JUN-15	R3216331
Sulfate in Water by IC							
Sulfate (SO4)	543		0.30	mg/L		25-JUN-15	R3218134
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	114		1.0	mg/L		07-JUL-15	R3221667

* 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
L1632021-2 CHE-3 (CHE-2)							
Sampled By: CLIENT on 22-JUN-15 @ 15:00							
Matrix: wastewater							
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0262		0.0050	mg/L	02-JUL-15	03-JUL-15	R3219930
Arsenic (As)-Total	0.00096		0.00020	mg/L	02-JUL-15	03-JUL-15	R3219930
Cadmium (Cd)-Total	0.000199		0.000010	mg/L	02-JUL-15	03-JUL-15	R3219930
Calcium (Ca)-Total	237		0.10	mg/L	02-JUL-15	03-JUL-15	R3219930
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	02-JUL-15	03-JUL-15	R3219930
Cobalt (Co)-Total	0.00073		0.00020	mg/L	02-JUL-15	03-JUL-15	R3219930
Copper (Cu)-Total	0.0100		0.00020	mg/L	02-JUL-15	03-JUL-15	R3219930
Iron (Fe)-Total	<0.10		0.10	mg/L	02-JUL-15	03-JUL-15	R3219930
Lead (Pb)-Total	0.000536		0.000090	mg/L	02-JUL-15	03-JUL-15	R3219930
Magnesium (Mg)-Total	20.2		0.010	mg/L	02-JUL-15	03-JUL-15	R3219930
Manganese (Mn)-Total	0.0733		0.00030	mg/L	02-JUL-15	03-JUL-15	R3219930
Nickel (Ni)-Total	0.0040		0.0020	mg/L	02-JUL-15	03-JUL-15	R3219930
Potassium (K)-Total	23.0		0.020	mg/L	02-JUL-15	03-JUL-15	R3219930
Sodium (Na)-Total	72.3		0.030	mg/L	02-JUL-15	03-JUL-15	R3219930
Zinc (Zn)-Total	0.0401		0.0020	mg/L	02-JUL-15	03-JUL-15	R3219930
Total Organic Carbon							
Total Organic Carbon	17.3		1.0	mg/L		22-JUL-15	R3231067
Total Suspended Solids							
Total Suspended Solids	<5.0		5.0	mg/L		29-JUN-15	R3217556
pH							
pH	7.81		0.10	pH units		07-JUL-15	R3221667
L1632021-3 CHE-4 (CHE-3)							
Sampled By: CLIENT on 22-JUN-15 @ 15:30							
Matrix: wastewater							
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	33.4		1.2	mg/L		08-JUL-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		08-JUL-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		08-JUL-15	
Ammonia by colour							
Ammonia, Total (as N)	0.053		0.010	mg/L		24-JUN-15	R3215314
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		25-JUN-15	R3222060
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		25-JUN-15	R3222060
Chloride in Water by IC							
Chloride (Cl)	17.3		0.50	mg/L		25-JUN-15	R3218134
Conductivity							
Conductivity	130		1.0	umhos/cm		07-JUL-15	R3221667
Fecal Coliform							
Fecal Coliforms	4	PEHT	3	MPN/100mL		24-JUN-15	R3218078
Hardness Calculated							
Hardness (as CaCO3)	24.1		0.30	mg/L		06-JUL-15	
Mercury Total							
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	29-JUN-15	29-JUN-15	R3217526
Nitrate in Water by IC							
Nitrate (as N)	0.566		0.020	mg/L		25-JUN-15	R3218134
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.579		0.070	mg/L		02-JUL-15	

* 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
L1632021-3 CHE-4 (CHE-3)							
Sampled By: CLIENT on 22-JUN-15 @ 15:30							
Matrix: wastewater							
Nitrite in Water by IC							
Nitrite (as N)	0.012		0.010	mg/L		25-JUN-15	R3218134
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	02-JUL-15	02-JUL-15	R3219466
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L		04-JUL-15	R3220221
Phosphorus, Total							
Phosphorus (P)-Total	0.040		0.010	mg/L		27-JUN-15	R3216331
Sulfate in Water by IC							
Sulfate (SO4)	6.08		0.30	mg/L		25-JUN-15	R3218134
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	27.4		1.0	mg/L		07-JUL-15	R3221667
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0250		0.0050	mg/L	02-JUL-15	03-JUL-15	R3219930
Arsenic (As)-Total	0.00028		0.00020	mg/L	02-JUL-15	03-JUL-15	R3219930
Cadmium (Cd)-Total	0.000016		0.000010	mg/L	02-JUL-15	03-JUL-15	R3219930
Calcium (Ca)-Total	6.33		0.10	mg/L	02-JUL-15	03-JUL-15	R3219930
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	02-JUL-15	03-JUL-15	R3219930
Cobalt (Co)-Total	<0.00020		0.00020	mg/L	02-JUL-15	03-JUL-15	R3219930
Copper (Cu)-Total	0.00741		0.00020	mg/L	02-JUL-15	03-JUL-15	R3219930
Iron (Fe)-Total	<0.10		0.10	mg/L	02-JUL-15	03-JUL-15	R3219930
Lead (Pb)-Total	<0.000090		0.000090	mg/L	02-JUL-15	03-JUL-15	R3219930
Magnesium (Mg)-Total	2.03		0.010	mg/L	02-JUL-15	03-JUL-15	R3219930
Manganese (Mn)-Total	<0.00030		0.00030	mg/L	02-JUL-15	03-JUL-15	R3219930
Nickel (Ni)-Total	0.0021		0.0020	mg/L	02-JUL-15	03-JUL-15	R3219930
Potassium (K)-Total	4.95		0.020	mg/L	02-JUL-15	03-JUL-15	R3219930
Sodium (Na)-Total	15.1		0.030	mg/L	02-JUL-15	03-JUL-15	R3219930
Zinc (Zn)-Total	<0.0020		0.0020	mg/L	02-JUL-15	03-JUL-15	R3219930
Total Organic Carbon							
Total Organic Carbon	8.7		1.0	mg/L		22-JUL-15	R3231067
Total Suspended Solids							
Total Suspended Solids	<5.0		5.0	mg/L		29-JUN-15	R3217556
pH							
pH	7.21		0.10	pH units		07-JUL-15	R3221667

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

Reference Information

Qualifiers for Individual Samples Listed:

Sample Numbe	Client ID	Qualifier	Description
L1632021-1	CHE-2 (CHE-1)	LPMB	Lab-Preserved for Total Metals. Sample received with pH > 2 and preserved at the lab. Total Metals results may be biased low.
L1632021-2	CHE-3 (CHE-2)	LPMB	Lab-Preserved for Total Metals. Sample received with pH > 2 and preserved at the lab. Total Metals results may be biased low.
L1632021-3	CHE-4 (CHE-3)	LPMB	Lab-Preserved for Total Metals. Sample received with pH > 2 and preserved at the lab. Total Metals results may be biased low.

Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHT	Parameter Exceeded Recommended Holding Time Prior to Analysis

Test Method References:

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

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

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

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

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

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

ALK-TITR-WP	Water	Total Alkalinity 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.

C-TOT-ORG-WP	Water	Total Organic Carbon	APHA 5310 B-INSTRUMENTAL-WP

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.
TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

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.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ETL-HARDNESS-TOT-WP	Water	Hardness Calculated	HARDNESS CALCULATED
FC-MPN-WP	Water	Fecal Coliform	APHA 9221E
The Most Probable Number (MPN) method is based on the Multiple Tube Fermentation technique. The results of examination of replicate tubes and dilutions of a sample are reported after confirmations specific to total coliform, fecal coliform and E. coli are performed. Results are reported in MPN/100 mL for water and MPN/gram for food and solid samples.			
HG-T-CVAF-WP	Water	Mercury Total	EPA245.7 V2.0
Mercury in filtered and unfiltered waters is oxidized with Bromine monochloride and analyzed by cold-vapour atomic fluorescence spectrometry.			
MET-T-L-MS-WP	Water	Total Metals by ICP-MS	APHA 3030E/EPA 6020A-TL
This analysis involves preliminary sample treatment by hotblock acid digestion (APHA 3030E). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
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.			
OGG-TOT-WT	Water	Oil and Grease, Total	APHA 5520 B
Sample is extracted with hexane, extract is then evaporated and the residue is weighed to determine total oil and grease.			
P-T-COL-WP	Water	Phosphorus, Total	APHA 4500 P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH-WP	Water	pH	APHA 4500H
The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			
SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)
Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1632021-COFC

COC Number: 14 - 454513

Page ____ of ____

Report To
Company: Hamlet of Chesterfield Inlet
Contact: Greg Tanuyak
Address: PO Box 10
Phone: (867) 898-9951

Report Format / D
Select Report Format: ☑ PDF ☐ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report ☑ Yes ☐ No
☑ Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: fore_hamlet@qiniq.com
Email 2

Turnaround Time (TAT) (Rush TAT is not available for all tests)
R ☐ Regular (Standard TAT if received by 3pm)
P ☐ Priority (2-4 business days if received by 3pm)
E ☐ Emergency (1-2 business days if received by 3pm)
E2 ☐ Same day or weekend emergency if received by 10am – contact ALS for surcharge.
Specify Date Required for E2,E or P:

Invoice To Same as Report To ☐ Yes ☐ No
Copy of Invoice with Report ☑ Yes ☐ No
Company:
Contact:

Invoice Distribution
Select Invoice Distribution: ☐ EMAIL ☑ MAIL ☐ FAX
Email 1 or Fax
Email 2

Project Information
ALS Quote #:
Job #:
PO / AFE:
LSD:

Oil and Gas Required Fields (client use)
Approver ID: [redacted] Cost Center: [redacted]
GL Account: [redacted] Routing Code: [redacted]
Activity Code: [redacted]
Location: [redacted]

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

Analysis Request
Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Routine	Nutrients	BOD	Bacteria	Phenols	Grease & Oil								Number of Containers
	[redacted]	[redacted]	[redacted]	[redacted]														
			2:45 PM															
1	CHE-2 (CHE-1)	22/06/15	[redacted]	Wastewater	✓	P	✓	P	P	P								8
			3:00 PM															
2	CHE-3 ((HE-2)	22/06/15	[redacted]	Wastewater	✓	P	✓	P	P	P								8
			3:30 PM															
	CHE-4 (CHE-3)	22/06/15	[redacted]	Wastewater	✓	P	✓	P	P	P								8

Drinking Water (DW) Samples[1] (client use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No
Are samples for human drinking water use? ☐ Yes ☐ No

Special Instructions / Specify Criteria to add on report (client Use)
Nunavut-WW-GRP1-WP

SAMPLE CONDITION AS RECEIVED (lab use only)
Frozen ☐ SIF Observations Yes ☐ No ☐
Ice packs Yes ☐ No ☐ Custody seal intact Yes ☐ No ☐
Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		

SHIPMENT RELEASE (client use)
Released by: [redacted] Date: 6/22/15 Time: 4:15PM

INITIAL SHIPMENT RECEPTION (lab use only)
Received by: EE Date: 6-24-15 Time: 9:35

FINAL SHIPMENT RECEPTION (lab use only)
Received by: Date: Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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 Chesterfield Inlet
ATTN: RICK VAN HORNE
PO Box 10
Chesterfield Inlet NU X0C 0B0

Date Received: 31-JUL-15
Report Date: 14-AUG-15 15:05 (MT)
Version: FINAL

Client Phone: 867-898-9926

Certificate of Analysis

Lab Work Order #: L1651346

Project P.O. #: NOT SUBMITTED
Job Reference: HAMLET OF CHCESTERFIELD INLET MONITORING PROGRAM
C of C Numbers:
Legal Site Desc:

Craig Riddell, B.Sc.Ag
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1651346-1 CHE-2							
Sampled By: SHELDON on 29-JUL-15 @ 11:00							
Matrix: WASTEWATER							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		06-AUG-15	R3241740
Toluene	<0.0010		0.0010	mg/L		06-AUG-15	R3241740
Ethyl benzene	<0.00050		0.00050	mg/L		06-AUG-15	R3241740
o-Xylene	<0.00050		0.00050	mg/L		06-AUG-15	R3241740
m+p-Xylenes	<0.00050		0.00050	mg/L		06-AUG-15	R3241740
F1 (C6-C10)	<0.10		0.10	mg/L		06-AUG-15	R3241740
Surrogate: 4-Bromofluorobenzene (SS)	94.4		70-130	%		06-AUG-15	R3241740
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		12-AUG-15	
F2-Naphth	<0.25		0.25	mg/L		12-AUG-15	
F3-PAH	0.32		0.25	mg/L		12-AUG-15	
Total Hydrocarbons (C6-C50)	<0.44		0.44	mg/L		12-AUG-15	
F2-F4 PHC method							
F2 (C10-C16)	<0.25		0.25	mg/L	06-AUG-15	06-AUG-15	R3241681
F3 (C16-C34)	0.32		0.25	mg/L	06-AUG-15	06-AUG-15	R3241681
F4 (C34-C50)	<0.25		0.25	mg/L	06-AUG-15	06-AUG-15	R3241681
Surrogate: 2-Bromobenzotrifluoride	97.0		60-140	%	06-AUG-15	06-AUG-15	R3241681
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.0015		0.0015	mg/L		07-AUG-15	
Miscellaneous Parameters							
Total Organic Carbon	21.7		1.0	mg/L		06-AUG-15	R3241636
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	10-AUG-15	11-AUG-15	R3245018
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	10-AUG-15	11-AUG-15	R3245018
Acenaphthene	<0.000020		0.000020	mg/L	10-AUG-15	11-AUG-15	R3245018
Acenaphthylene	<0.000020		0.000020	mg/L	10-AUG-15	11-AUG-15	R3245018
Anthracene	<0.000010		0.000010	mg/L	10-AUG-15	11-AUG-15	R3245018
Acridine	<0.000020		0.000020	mg/L	10-AUG-15	11-AUG-15	R3245018
Benzo(a)anthracene	<0.000010		0.000010	mg/L	10-AUG-15	11-AUG-15	R3245018
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	10-AUG-15	11-AUG-15	R3245018
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	10-AUG-15	11-AUG-15	R3245018
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	10-AUG-15	11-AUG-15	R3245018
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	10-AUG-15	11-AUG-15	R3245018
Chrysene	<0.000020		0.000020	mg/L	10-AUG-15	11-AUG-15	R3245018
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	10-AUG-15	11-AUG-15	R3245018
Fluoranthene	<0.000020		0.000020	mg/L	10-AUG-15	11-AUG-15	R3245018
Fluorene	<0.000020		0.000020	mg/L	10-AUG-15	11-AUG-15	R3245018
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	10-AUG-15	11-AUG-15	R3245018
Naphthalene	<0.000050		0.000050	mg/L	10-AUG-15	11-AUG-15	R3245018
Phenanthrene	<0.000050		0.000050	mg/L	10-AUG-15	11-AUG-15	R3245018
Pyrene	<0.000010		0.000010	mg/L	10-AUG-15	11-AUG-15	R3245018
Quinoline	0.000101	EMPC	0.000020	mg/L	10-AUG-15	11-AUG-15	R3245018
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	10-AUG-15	11-AUG-15	R3245018
Surrogate: Acenaphthene d10	78.3		40-130	%	10-AUG-15	11-AUG-15	R3245018
Surrogate: Acridine d9	87.0		40-130	%	10-AUG-15	11-AUG-15	R3245018
Surrogate: Chrysene d12	91.9		40-130	%	10-AUG-15	11-AUG-15	R3245018
Surrogate: Naphthalene d8	71.5		40-130	%	10-AUG-15	11-AUG-15	R3245018
Surrogate: Phenanthrene d10	81.0		40-130	%	10-AUG-15	11-AUG-15	R3245018
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	269		1.2	mg/L		14-AUG-15	

* 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
L1651346-1 CHE-2							
Sampled By: SHELDON on 29-JUL-15 @ 11:00							
Matrix: WASTEWATER							
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		14-AUG-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		14-AUG-15	
Ammonia by colour							
Ammonia, Total (as N)	0.077		0.010	mg/L		04-AUG-15	R3238113
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		01-AUG-15	R3242501
Carbonaceous BOD							
BOD Carbonaceous	2.0		2.0	mg/L		01-AUG-15	R3242501
Chloride in Water by IC							
Chloride (Cl)	288		1.0	mg/L		01-AUG-15	R3239627
Conductivity							
Conductivity	1770		1.0	umhos/cm		12-AUG-15	R3246377
Fecal Coliform							
Fecal Coliforms	4	PEHR	3	MPN/100mL		31-JUL-15	R3240882
Hardness Calculated							
Hardness (as CaCO3)	360		0.30	mg/L		06-AUG-15	
Mercury Total							
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	05-AUG-15	05-AUG-15	R3241837
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		01-AUG-15	R3239627
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		05-AUG-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		01-AUG-15	R3239627
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	05-AUG-15	05-AUG-15	R3240339
Phenol (4AAP)							
Phenols (4AAP)	0.0033		0.0010	mg/L		12-AUG-15	R3245440
Phosphorus, Total							
Phosphorus (P)-Total	0.084		0.010	mg/L		10-AUG-15	R3243538
Sulfate in Water by IC							
Sulfate (SO4)	255		0.60	mg/L		01-AUG-15	R3239627
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	221		1.0	mg/L		12-AUG-15	R3246377
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0256		0.0050	mg/L	05-AUG-15	05-AUG-15	R3240401
Arsenic (As)-Total	0.00078		0.00020	mg/L	05-AUG-15	05-AUG-15	R3240401
Cadmium (Cd)-Total	0.000023		0.000010	mg/L	05-AUG-15	05-AUG-15	R3240401
Calcium (Ca)-Total	107		0.10	mg/L	05-AUG-15	05-AUG-15	R3240401
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	05-AUG-15	05-AUG-15	R3240401
Cobalt (Co)-Total	0.00070		0.00020	mg/L	05-AUG-15	05-AUG-15	R3240401
Copper (Cu)-Total	0.00338		0.00020	mg/L	05-AUG-15	05-AUG-15	R3240401
Iron (Fe)-Total	0.34		0.10	mg/L	05-AUG-15	05-AUG-15	R3240401
Lead (Pb)-Total	0.000172		0.000090	mg/L	05-AUG-15	05-AUG-15	R3240401
Magnesium (Mg)-Total	22.4		0.010	mg/L	05-AUG-15	05-AUG-15	R3240401
Manganese (Mn)-Total	0.0369		0.00030	mg/L	05-AUG-15	05-AUG-15	R3240401
Nickel (Ni)-Total	0.0056		0.0020	mg/L	05-AUG-15	05-AUG-15	R3240401
Potassium (K)-Total	38.9		0.020	mg/L	05-AUG-15	05-AUG-15	R3240401
Sodium (Na)-Total	164		0.030	mg/L	05-AUG-15	05-AUG-15	R3240401
Zinc (Zn)-Total	0.0134		0.0020	mg/L	05-AUG-15	05-AUG-15	R3240401
Total Suspended Solids							

* 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
L1651346-1 CHE-2							
Sampled By: SHELDON on 29-JUL-15 @ 11:00							
Matrix: WASTEWATER							
Total Suspended Solids							
Total Suspended Solids	<5.0		5.0	mg/L		06-AUG-15	R3241826
pH							
pH	7.70		0.10	pH units		12-AUG-15	R3246377
L1651346-2 CHE-3							
Sampled By: SHELDON on 29-JUL-15 @ 11:50							
Matrix: WASTEWATER							
Miscellaneous Parameters							
Total Organic Carbon	143	DLA	10	mg/L		06-AUG-15	R3241636
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	442		1.2	mg/L		14-AUG-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		14-AUG-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		14-AUG-15	
Ammonia by colour							
Ammonia, Total (as N)	74.4	DLA	2.0	mg/L		05-AUG-15	R3240609
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	306	DLA	50	mg/L		01-AUG-15	R3242501
Carbonaceous BOD							
BOD Carbonaceous	302	DLA	50	mg/L		01-AUG-15	R3242501
Chloride in Water by IC							
Chloride (Cl)	63.5		0.50	mg/L		01-AUG-15	R3239627
Conductivity							
Conductivity	990		1.0	umhos/cm		12-AUG-15	R3246377
Fecal Coliform							
Fecal Coliforms	>110000	PEHR	3	MPN/100mL		31-JUL-15	R3240882
Hardness Calculated							
Hardness (as CaCO3)	44.8		0.30	mg/L		06-AUG-15	
Mercury Total							
Mercury (Hg)-Total	<0.00040	DLM	0.00040	mg/L	05-AUG-15	05-AUG-15	R3241837
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		01-AUG-15	R3239627
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		05-AUG-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		01-AUG-15	R3239627
Oil and Grease, Total							
Oil and Grease, Total	60.7		2.0	mg/L	05-AUG-15	05-AUG-15	R3240339
Phenol (4AAP)							
Phenols (4AAP)	0.0048		0.0010	mg/L		12-AUG-15	R3245440
Phosphorus, Total							
Phosphorus (P)-Total	11.6		0.010	mg/L		10-AUG-15	R3243538
Sulfate in Water by IC							
Sulfate (SO4)	12.8		0.30	mg/L		01-AUG-15	R3239627
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	363		1.0	mg/L		12-AUG-15	R3246377
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.552		0.0050	mg/L	05-AUG-15	05-AUG-15	R3240401
Arsenic (As)-Total	0.00059		0.00020	mg/L	05-AUG-15	05-AUG-15	R3240401
Cadmium (Cd)-Total	0.000222		0.000010	mg/L	05-AUG-15	05-AUG-15	R3240401
Calcium (Ca)-Total	11.1		0.10	mg/L	05-AUG-15	05-AUG-15	R3240401

* 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
L1651346-2 CHE-3							
Sampled By: SHELDON on 29-JUL-15 @ 11:50							
Matrix: WASTEWATER							
Total Metals by ICP-MS							
Chromium (Cr)-Total	0.0016		0.0010	mg/L	05-AUG-15	05-AUG-15	R3240401
Cobalt (Co)-Total	0.00063		0.00020	mg/L	05-AUG-15	05-AUG-15	R3240401
Copper (Cu)-Total	0.114		0.00020	mg/L	05-AUG-15	05-AUG-15	R3240401
Iron (Fe)-Total	0.79		0.10	mg/L	05-AUG-15	05-AUG-15	R3240401
Lead (Pb)-Total	0.00234		0.000090	mg/L	05-AUG-15	05-AUG-15	R3240401
Magnesium (Mg)-Total	4.17		0.010	mg/L	05-AUG-15	05-AUG-15	R3240401
Manganese (Mn)-Total	0.0398		0.00030	mg/L	05-AUG-15	05-AUG-15	R3240401
Nickel (Ni)-Total	0.0034		0.0020	mg/L	05-AUG-15	05-AUG-15	R3240401
Potassium (K)-Total	23.3		0.020	mg/L	05-AUG-15	05-AUG-15	R3240401
Sodium (Na)-Total	50.7		0.030	mg/L	05-AUG-15	05-AUG-15	R3240401
Zinc (Zn)-Total	0.206		0.0020	mg/L	05-AUG-15	05-AUG-15	R3240401
Total Suspended Solids							
Total Suspended Solids	100		5.0	mg/L		06-AUG-15	R3241826
pH							
pH	7.53		0.10	pH units		12-AUG-15	R3246377
L1651346-3 CHE-4							
Sampled By: SHELDON on 29-JUL-15 @ 11:30							
Matrix: WASTEWATER							
Miscellaneous Parameters							
Total Organic Carbon	12.2		1.0	mg/L		06-AUG-15	R3241636
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	69.4		1.2	mg/L		14-AUG-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		14-AUG-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		14-AUG-15	
Ammonia by colour							
Ammonia, Total (as N)	0.117		0.010	mg/L		04-AUG-15	R3238113
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		01-AUG-15	R3242501
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		01-AUG-15	R3242501
Chloride in Water by IC							
Chloride (Cl)	29.3		0.50	mg/L		01-AUG-15	R3239627
Conductivity							
Conductivity	225		1.0	umhos/cm		12-AUG-15	R3246377
Fecal Coliform							
Fecal Coliforms	<3	PEHR	3	MPN/100mL		31-JUL-15	R3240882
Hardness Calculated							
Hardness (as CaCO3)	47.9		0.30	mg/L		06-AUG-15	
Mercury Total							
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	05-AUG-15	05-AUG-15	R3241837
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		01-AUG-15	R3239627
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		05-AUG-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		01-AUG-15	R3239627
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	05-AUG-15	05-AUG-15	R3240339
Phenol (4AAP)							

* 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
L1651346-3 CHE-4							
Sampled By: SHELDON on 29-JUL-15 @ 11:30							
Matrix: WASTEWATER							
Phenol (4AAP)							
Phenols (4AAP)	0.0017		0.0010	mg/L		12-AUG-15	R3245440
Phosphorus, Total							
Phosphorus (P)-Total	0.012		0.010	mg/L		10-AUG-15	R3243538
Sulfate in Water by IC							
Sulfate (SO4)	9.63		0.30	mg/L		01-AUG-15	R3239627
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	56.9		1.0	mg/L		12-AUG-15	R3246377
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0338		0.0050	mg/L	05-AUG-15	05-AUG-15	R3240401
Arsenic (As)-Total	0.00043		0.00020	mg/L	05-AUG-15	05-AUG-15	R3240401
Cadmium (Cd)-Total	0.000011		0.000010	mg/L	05-AUG-15	05-AUG-15	R3240401
Calcium (Ca)-Total	12.9		0.10	mg/L	05-AUG-15	05-AUG-15	R3240401
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	05-AUG-15	05-AUG-15	R3240401
Cobalt (Co)-Total	0.00032		0.00020	mg/L	05-AUG-15	05-AUG-15	R3240401
Copper (Cu)-Total	0.00659		0.00020	mg/L	05-AUG-15	05-AUG-15	R3240401
Iron (Fe)-Total	0.11		0.10	mg/L	05-AUG-15	05-AUG-15	R3240401
Lead (Pb)-Total	<0.000090		0.000090	mg/L	05-AUG-15	05-AUG-15	R3240401
Magnesium (Mg)-Total	3.82		0.010	mg/L	05-AUG-15	05-AUG-15	R3240401
Manganese (Mn)-Total	0.00259		0.00030	mg/L	05-AUG-15	05-AUG-15	R3240401
Nickel (Ni)-Total	0.0034		0.0020	mg/L	05-AUG-15	05-AUG-15	R3240401
Potassium (K)-Total	1.84		0.020	mg/L	05-AUG-15	05-AUG-15	R3240401
Sodium (Na)-Total	26.8		0.030	mg/L	05-AUG-15	05-AUG-15	R3240401
Zinc (Zn)-Total	<0.0020		0.0020	mg/L	05-AUG-15	05-AUG-15	R3240401
Total Suspended Solids							
Total Suspended Solids	<5.0		5.0	mg/L		06-AUG-15	R3241826
pH							
pH	7.41		0.10	pH units		12-AUG-15	R3246377

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.
EMPC	Estimated Maximum Possible Concentration. Parameter detected but didn't meet all criteria for positive identification.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.

Test Method References:

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

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

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

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

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

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

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

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

BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B

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

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

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

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

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

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.

ETL-HARDNESS-TOT-WP	Water	Hardness Calculated	HARDNESS CALCULATED
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.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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	F2-F4 PHC method	CWS (CCME)

Petroleum Hydrocarbons (F2-F4) in Water Method is adapted from US EPA Method 3511: Organic Compounds in Water by Micro-extraction" (Nov 2002) with instrumental analysis as per the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method" (CCMS, Dec 2000) Water samples (in their entirety) are extracted using hexane prior to capillary column gas chromatography with flame ionization detection (GC/FID).

FC-MPN-WP	Water	Fecal Coliform	APHA 9221E

The Most Probable Number (MPN) method is based on the Multiple Tube Fermentation technique. The results of examination of replicate tubes and dilutions of a sample are reported after confirmations specific to total coliform, fecal coliform and E. coli are performed. Results are reported in MPN/100 mL for water and MPN/gram for food and solid samples.

HG-T-CVAF-WP	Water	Mercury Total	EPA245.7 V2.0

Mercury in filtered and unfiltered waters is oxidized with Bromine monochloride and analyzed by cold-vapour atomic fluorescence spectrometry.

MET-T-L-MS-WP	Water	Total Metals by ICP-MS	APHA 3030E/EPA 6020A-TL

This analysis involves preliminary sample treatment by hotblock acid digestion (APHA 3030E). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

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.

OGG-TOT-WT	Water	Oil and Grease, Total	APHA 5520 B

Sample is extracted with hexane, extract is then evaporated and the residue is weighed to determine total oil and grease.

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

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

PAH,PANH-WP	Water	Polyaromatic Hydrocarbons (PAHs)	EPA SW 846/8270-GC/MS

Water is spiked with a surrogate spike mix and extracted using solvent extraction techniques. Analysis is performed by GC/MS in the selected ion monitoring (SIM) mode.

PH-WP	Water	pH	APHA 4500H

The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)

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

SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
		Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.	
TOC-WT	Water	Total Organic Carbon	APHA 5310B
		Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.	
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:

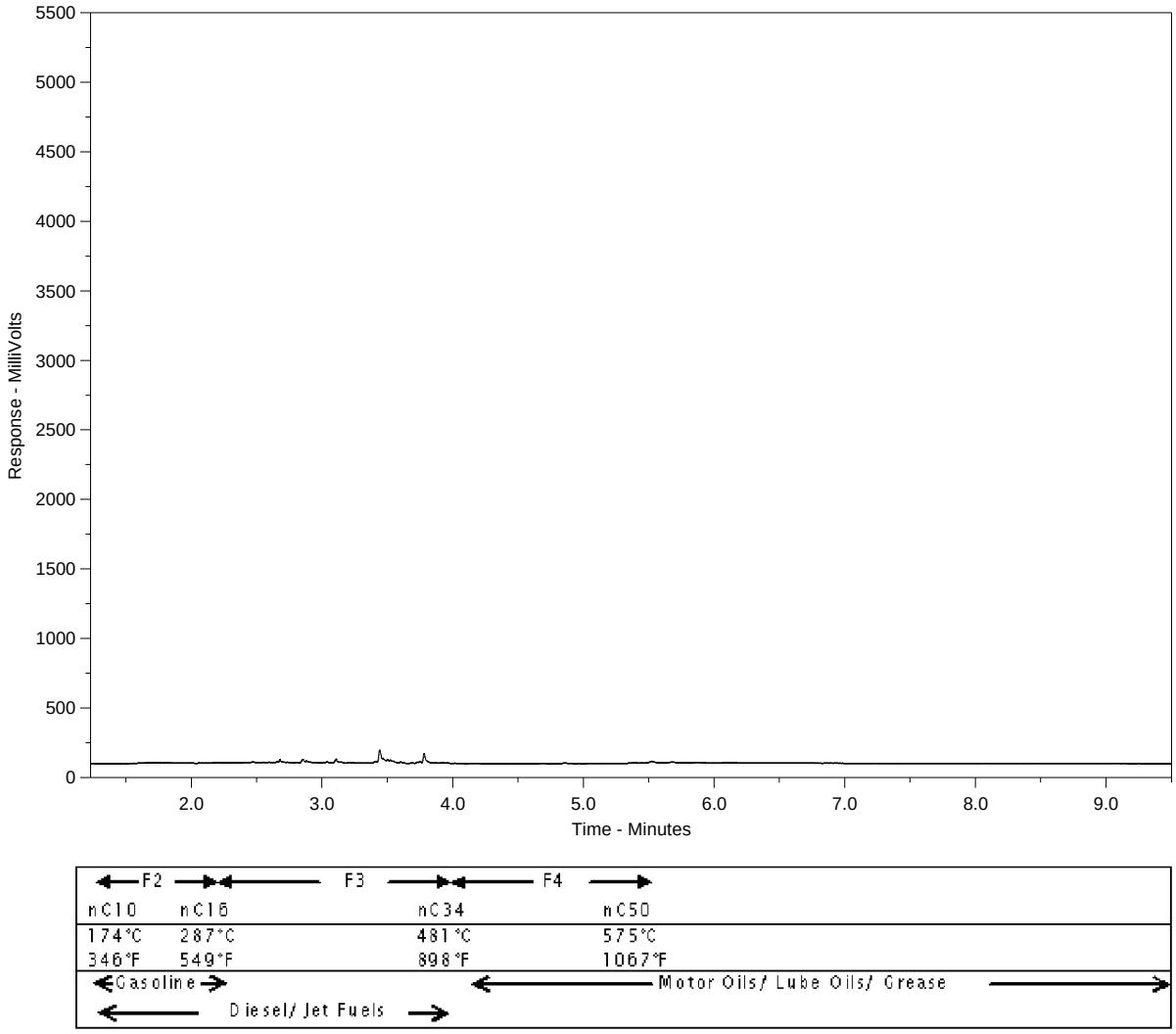
GLOSSARY OF REPORT TERMS

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: L1651346-1
Client Sample ID: CHE-2



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

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

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

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

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1651346-COFC

COC Number: 14 - 454514

Page 1 of 1

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Hamlet of Chesterfield Inlet	Select Report Format:	☒ PDF ☐ EXCEL ☐ EDD (DIGITAL)	R ☒ Regular (Standard TAT if received by 3pm)
Contact:	Rick Van Horne	Quality Control (QC) Report with Report	☐ Yes ☐ No	P ☐ Priority (2-4 business days if received by 3pm)
Address:	P.O. Box 10 Chesterfield Inlet, NU X0C 0B0	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 business days if received by 3pm)
		Select Distribution:	☐ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency if received by 10am – contact ALS for surcharge.
Phone:	(867) 898-9926	Email 1 or Fax	sao_hamlet@qiniq.com	Specify Date Required for E2,E or P:
		Email 2	[redacted]mlusty@gov.nu.ca	

Invoice To			Invoice Distribution	
	Same as Report To	☒ Yes ☐ No	Select Invoice Distribution:	☒ EMAIL ☐ MAIL ☐ FAX
	Copy of Invoice with Report	☒ Yes ☐ No		
Company:			Email 1 or Fax	
Contact:			Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Hamlet of Chesterfield Inlet Monitoring Program	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only):

ALS Contact: Craig Riddell

Sampler: Sheldon

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Routine	BOD	Phenols	Mercury	Nutrients	Oil + Grease (x2)	Bacteria	Metals Group1	PAH	BTEX-F1 (x3)	F2-F4 (x2)	Group8	Number of Containers
	CHE-2	29,07,15	11:00am	wastewater	✓	✓	P	P	P	P	P	P	P	P	P		15
	CHE-3	29,07,15	11:50am	wastewater	✓	✓	P	P	P	P	P	P					9
	CHE-4	29,07,15	11:30am	wastewater	✓	✓	P	P	P	P	P	P					9

Drinking Water (DW) Samples' (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☒ No	WW - NUNAVUT - PAH - BTEX - F2 - F4
Are samples for human drinking water use? ☐ Yes ☒ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐	SIF Observations	Yes ☐	No ☐	
Ice packs	Yes ☐	No ☐	Custody seal Intact	Yes ☐	No ☐
Cooling Initiated	☐				

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
Sheldon	07,29,15	1:40pm	CC 31/07/15	4:00	17°C			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA FM 0326a v08 Front/03 October 2013

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.

Field Log

Name of Sampler(s): She Hon Putumirag#val

Date of Sampling: July 29, 2015

Time of Sampling: 11:30am

Monitoring Station Number: CHE-4

GPS Coordinates: N 63 ° 20 ' 993 " W 090 ° 45 ' 601 "

Weather Conditions: Foggy

Samples:

- [x] 500 mL BOD
- [x] 1 L Routine
- [x] 250 mL Metals + Pres
- [x] 40 mL Glass Mercury Vial + Pres
- [x] 250 mL Amber Nutrients + Pres
- [x] 250 mL Amber Phenols + Pres
- [x] 125 mL Sterile Bacteria Bottle
- [x] **2 x** 500 mL Glass Oil & Grease + Pres
- [ ] 1 L Amber PAH + Pres
- [ ] **3 x** 40 mL BTEX, F1 Vials + Pres
- [ ] **2 x** 60 mL Amber F2-F4 Vials + Pres

Other:

- [ ] _____
- [ ] _____
- [ ] _____

Other Notes: (any unusual conditions, any deviation from standard procedures, etc.)

_____

_____

_____

_____

_____

Field Log

Name of Sampler(s): Shellon Putomiraqtuq

Date of Sampling: July 29, 2015

Time of Sampling: 11:50 am

Monitoring Station Number: CHE-3

GPS Coordinates: N 63 ° 20 ' 677 " W 090 ° 45 ' 074 "

Weather Conditions: Foggy

Samples:

- [x] 500 mL BOD
- [x] 1 L Routine
- [x] 250 mL Metals + Pres
- [x] 40 mL Glass Mercury Vial + Pres
- [x] 250 mL Amber Nutrients + Pres
- [x] 250 mL Amber Phenols + Pres
- [x] 125 mL Sterile Bacteria Bottle
- [x] **2 x** 500 mL Glass Oil & Grease + Pres
- [ ] 1 L Amber PAH + Pres
- [ ] **3 x** 40 mL BTEX, F1 Vials + Pres
- [ ] **2 x** 60 mL Amber F2-F4 Vials + Pres

Other:

- [ ] _____
- [ ] _____
- [ ] _____

Other Notes: (any unusual conditions, any deviation from standard procedures, etc.)

Hamlet of Chesterfield Inlet
ATTN: RICK VAN HORNE
PO Box 10
Chesterfield Inlet NU X0C 0B0

Date Received: 20-AUG-15
Report Date: 03-SEP-15 06:58 (MT)
Version: FINAL

Client Phone: 867-898-9926

Certificate of Analysis

Lab Work Order #: L1660831

Project P.O. #: NOT SUBMITTED
Job Reference: CHESTERFIELD INLET MONITORING STATION
C of C Numbers:
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1660831-1 CHE-2							
Sampled By: SHELDON on 18-AUG-15 @ 09:50							
Matrix: WW							
BTEX plus F1-F4							
BTX plus F1 by GCMS							
Benzene	<0.00050		0.00050	mg/L		28-AUG-15	R3256939
Toluene	<0.0010		0.0010	mg/L		28-AUG-15	R3256939
Ethyl benzene	<0.00050		0.00050	mg/L		28-AUG-15	R3256939
o-Xylene	<0.00050		0.00050	mg/L		28-AUG-15	R3256939
m+p-Xylenes	<0.00050		0.00050	mg/L		28-AUG-15	R3256939
F1 (C6-C10)	<0.10		0.10	mg/L		28-AUG-15	R3256939
Surrogate: 4-Bromofluorobenzene (SS)	97.4		70-130	%		28-AUG-15	R3256939
CCME Total Hydrocarbons							
F1-BTEX	<0.10		0.10	mg/L		01-SEP-15	
F2-Naphth	<0.25		0.25	mg/L		01-SEP-15	
F3-PAH	<0.25		0.25	mg/L		01-SEP-15	
Total Hydrocarbons (C6-C50)	<0.44		0.44	mg/L		01-SEP-15	
F2-F4 PHC method							
F2 (C10-C16)	<0.25		0.25	mg/L	26-AUG-15	27-AUG-15	R3254980
F3 (C16-C34)	<0.25		0.25	mg/L	26-AUG-15	27-AUG-15	R3254980
F4 (C34-C50)	0.37		0.25	mg/L	26-AUG-15	27-AUG-15	R3254980
Surrogate: 2-Bromobenzotrifluoride	88.2		60-140	%	26-AUG-15	27-AUG-15	R3254980
Sum of Xylene Isomer Concentrations							
Xylenes (Total)	<0.0015		0.0015	mg/L		31-AUG-15	
Miscellaneous Parameters							
Total Organic Carbon	25.7		1.0	mg/L		25-AUG-15	R3253553
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-AUG-15	29-AUG-15	R3255859
2-Methyl Naphthalene	<0.000020		0.000020	mg/L	27-AUG-15	29-AUG-15	R3255859
Acenaphthene	<0.000020		0.000020	mg/L	27-AUG-15	29-AUG-15	R3255859
Acenaphthylene	<0.000020		0.000020	mg/L	27-AUG-15	29-AUG-15	R3255859
Anthracene	<0.000010		0.000010	mg/L	27-AUG-15	29-AUG-15	R3255859
Acridine	<0.000020		0.000020	mg/L	27-AUG-15	29-AUG-15	R3255859
Benzo(a)anthracene	<0.000010		0.000010	mg/L	27-AUG-15	29-AUG-15	R3255859
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	27-AUG-15	29-AUG-15	R3255859
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	27-AUG-15	29-AUG-15	R3255859
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	27-AUG-15	29-AUG-15	R3255859
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	27-AUG-15	29-AUG-15	R3255859
Chrysene	<0.000020		0.000020	mg/L	27-AUG-15	29-AUG-15	R3255859
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	27-AUG-15	29-AUG-15	R3255859
Fluoranthene	<0.000020		0.000020	mg/L	27-AUG-15	29-AUG-15	R3255859
Fluorene	<0.000020		0.000020	mg/L	27-AUG-15	29-AUG-15	R3255859
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	27-AUG-15	29-AUG-15	R3255859
Naphthalene	<0.000050		0.000050	mg/L	27-AUG-15	29-AUG-15	R3255859
Phenanthrene	<0.000050		0.000050	mg/L	27-AUG-15	29-AUG-15	R3255859
Pyrene	<0.000010		0.000010	mg/L	27-AUG-15	29-AUG-15	R3255859
Quinoline	<0.00015	DLM	0.00015	mg/L	27-AUG-15	29-AUG-15	R3255859
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	27-AUG-15	29-AUG-15	R3255859
Surrogate: Acenaphthene d10	87.5		40-130	%	27-AUG-15	29-AUG-15	R3255859
Surrogate: Acridine d9	101.0		40-130	%	27-AUG-15	29-AUG-15	R3255859
Surrogate: Chrysene d12	94.6		40-130	%	27-AUG-15	29-AUG-15	R3255859
Surrogate: Naphthalene d8	83.7		40-130	%	27-AUG-15	29-AUG-15	R3255859
Surrogate: Phenanthrene d10	90.3		40-130	%	27-AUG-15	29-AUG-15	R3255859
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	352		1.2	mg/L		01-SEP-15	

* 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
L1660831-1 CHE-2							
Sampled By: SHELDON on 18-AUG-15 @ 09:50							
Matrix: WW							
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		01-SEP-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		01-SEP-15	
Ammonia by colour							
Ammonia, Total (as N)	0.099		0.010	mg/L		28-AUG-15	R3256770
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		21-AUG-15	R3255529
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		21-AUG-15	R3255529
Chloride in Water by IC							
Chloride (Cl)	355		1.0	mg/L		21-AUG-15	R3254095
Conductivity							
Conductivity	2260		1.0	umhos/cm		31-AUG-15	R3257924
Fecal Coliform							
Fecal Coliforms	4	PEHR	3	MPN/100mL		20-AUG-15	R3253936
Hardness Calculated							
Hardness (as CaCO3)	524		0.30	mg/L		26-AUG-15	
Mercury Total							
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	25-AUG-15	25-AUG-15	R3253685
Nitrate in Water by IC							
Nitrate (as N)	<0.040	DLM	0.040	mg/L		21-AUG-15	R3254095
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		26-AUG-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.020	DLM	0.020	mg/L		21-AUG-15	R3254095
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	24-AUG-15	24-AUG-15	R3253479
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L	31-AUG-15	31-AUG-15	R3256906
Phosphorus, Total							
Phosphorus (P)-Total	0.076		0.010	mg/L		28-AUG-15	R3255661
Sulfate in Water by IC							
Sulfate (SO4)	419		0.60	mg/L		21-AUG-15	R3254095
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	289		1.0	mg/L		31-AUG-15	R3257924
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0163		0.0050	mg/L	25-AUG-15	25-AUG-15	R3253582
Arsenic (As)-Total	0.00107		0.00020	mg/L	25-AUG-15	25-AUG-15	R3253582
Cadmium (Cd)-Total	<0.000010		0.000010	mg/L	25-AUG-15	25-AUG-15	R3253582
Calcium (Ca)-Total	151		0.10	mg/L	25-AUG-15	25-AUG-15	R3253582
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	25-AUG-15	25-AUG-15	R3253582
Cobalt (Co)-Total	0.00089		0.00020	mg/L	25-AUG-15	25-AUG-15	R3253582
Copper (Cu)-Total	0.00142		0.00020	mg/L	25-AUG-15	25-AUG-15	R3253582
Iron (Fe)-Total	0.43		0.10	mg/L	25-AUG-15	25-AUG-15	R3253582
Lead (Pb)-Total	0.000156		0.000090	mg/L	25-AUG-15	25-AUG-15	R3253582
Magnesium (Mg)-Total	35.8		0.010	mg/L	25-AUG-15	25-AUG-15	R3253582
Manganese (Mn)-Total	0.0673		0.00030	mg/L	25-AUG-15	25-AUG-15	R3253582
Nickel (Ni)-Total	0.0064		0.0020	mg/L	25-AUG-15	25-AUG-15	R3253582
Potassium (K)-Total	65.2		0.020	mg/L	25-AUG-15	25-AUG-15	R3253582
Sodium (Na)-Total	262		0.030	mg/L	25-AUG-15	25-AUG-15	R3253582
Zinc (Zn)-Total	0.0061		0.0020	mg/L	25-AUG-15	25-AUG-15	R3253582
Total Suspended Solids							

* 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
L1660831-1 CHE-2							
Sampled By: SHELDON on 18-AUG-15 @ 09:50							
Matrix: WW							
Total Suspended Solids							
Total Suspended Solids	5.0		5.0	mg/L		24-AUG-15	R3253983
pH							
pH	7.18		0.10	pH units		31-AUG-15	R3257924
L1660831-2 CHE-3							
Sampled By: SHELDON on 18-AUG-15 @ 10:30							
Matrix: WW							
Miscellaneous Parameters							
Total Organic Carbon	124	DLA	10	mg/L		25-AUG-15	R3253553
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	416		1.2	mg/L		01-SEP-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		01-SEP-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		01-SEP-15	
Ammonia by colour							
Ammonia, Total (as N)	69.9		2.0	mg/L		26-AUG-15	R3254918
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	260	DLA	50	mg/L		21-AUG-15	R3255529
Carbonaceous BOD							
BOD Carbonaceous	253	DLA	50	mg/L		21-AUG-15	R3255529
Chloride in Water by IC							
Chloride (Cl)	71.9		0.50	mg/L		21-AUG-15	R3254095
Conductivity							
Conductivity	955		1.0	umhos/cm		31-AUG-15	R3257924
Fecal Coliform							
Fecal Coliforms	>110000	PEHR	3	MPN/100mL		20-AUG-15	R3253936
Hardness Calculated							
Hardness (as CaCO3)	57.7		0.30	mg/L		26-AUG-15	
Mercury Total							
Mercury (Hg)-Total	<0.00040	DLM	0.00040	mg/L	25-AUG-15	25-AUG-15	R3253685
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		21-AUG-15	R3254095
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		26-AUG-15	
Nitrite in Water by IC							
Nitrite (as N)	0.025		0.010	mg/L		21-AUG-15	R3254095
Oil and Grease, Total							
Oil and Grease, Total	473		2.0	mg/L	24-AUG-15	24-AUG-15	R3253479
Phenol (4AAP)							
Phenols (4AAP)	0.152	DLA	0.050	mg/L	31-AUG-15	31-AUG-15	R3256906
Phosphorus, Total							
Phosphorus (P)-Total	10.6		0.010	mg/L		28-AUG-15	R3255661
Sulfate in Water by IC							
Sulfate (SO4)	11.6		0.30	mg/L		21-AUG-15	R3254095
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	341		1.0	mg/L		31-AUG-15	R3257924
Total Metals by ICP-MS							
Aluminum (Al)-Total	1.00		0.0050	mg/L	25-AUG-15	25-AUG-15	R3253582
Arsenic (As)-Total	0.00096		0.00020	mg/L	25-AUG-15	25-AUG-15	R3253582
Cadmium (Cd)-Total	0.000370		0.000010	mg/L	25-AUG-15	25-AUG-15	R3253582
Calcium (Ca)-Total	14.7		0.10	mg/L	25-AUG-15	25-AUG-15	R3253582

* 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
L1660831-2 CHE-3							
Sampled By: SHELDON on 18-AUG-15 @ 10:30							
Matrix: WW							
Total Metals by ICP-MS							
Chromium (Cr)-Total	0.0028		0.0010	mg/L	25-AUG-15	25-AUG-15	R3253582
Cobalt (Co)-Total	0.00096		0.00020	mg/L	25-AUG-15	25-AUG-15	R3253582
Copper (Cu)-Total	0.221		0.00020	mg/L	25-AUG-15	25-AUG-15	R3253582
Iron (Fe)-Total	1.61		0.10	mg/L	25-AUG-15	25-AUG-15	R3253582
Lead (Pb)-Total	0.0206		0.000090	mg/L	25-AUG-15	25-AUG-15	R3253582
Magnesium (Mg)-Total	5.07		0.010	mg/L	25-AUG-15	25-AUG-15	R3253582
Manganese (Mn)-Total	0.0609		0.00030	mg/L	25-AUG-15	25-AUG-15	R3253582
Nickel (Ni)-Total	0.0053		0.0020	mg/L	25-AUG-15	25-AUG-15	R3253582
Potassium (K)-Total	25.6		0.020	mg/L	25-AUG-15	25-AUG-15	R3253582
Sodium (Na)-Total	52.5		0.030	mg/L	25-AUG-15	25-AUG-15	R3253582
Zinc (Zn)-Total	0.304		0.0020	mg/L	25-AUG-15	25-AUG-15	R3253582
Total Suspended Solids							
Total Suspended Solids	440		5.0	mg/L		24-AUG-15	R3253983
pH							
pH	6.91		0.10	pH units		31-AUG-15	R3257924
L1660831-3 CHE-4							
Sampled By: SHELDON on 18-AUG-15 @ 09:30							
Matrix: WW							
Miscellaneous Parameters							
Total Organic Carbon	9.9		1.0	mg/L		25-AUG-15	R3253553
Nunavut WW Group 1							
Alkalinity, Bicarbonate							
Bicarbonate (HCO3)	74.7		1.2	mg/L		02-SEP-15	
Alkalinity, Carbonate							
Carbonate (CO3)	<0.60		0.60	mg/L		02-SEP-15	
Alkalinity, Hydroxide							
Hydroxide (OH)	<0.34		0.34	mg/L		02-SEP-15	
Ammonia by colour							
Ammonia, Total (as N)	<0.010		0.010	mg/L		26-AUG-15	R3254918
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<2.0		2.0	mg/L		21-AUG-15	R3255529
Carbonaceous BOD							
BOD Carbonaceous	<2.0		2.0	mg/L		21-AUG-15	R3255529
Chloride in Water by IC							
Chloride (Cl)	35.6		0.50	mg/L		21-AUG-15	R3254095
Conductivity							
Conductivity	259		1.0	umhos/cm		31-AUG-15	R3257924
Fecal Coliform							
Fecal Coliforms	<3	PEHR	3	MPN/100mL		20-AUG-15	R3253936
Hardness Calculated							
Hardness (as CaCO3)	61.8		0.30	mg/L		26-AUG-15	
Mercury Total							
Mercury (Hg)-Total	<0.00020	DLM	0.00020	mg/L	25-AUG-15	25-AUG-15	R3253685
Nitrate in Water by IC							
Nitrate (as N)	<0.020		0.020	mg/L		21-AUG-15	R3254095
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.070		0.070	mg/L		26-AUG-15	
Nitrite in Water by IC							
Nitrite (as N)	<0.010		0.010	mg/L		21-AUG-15	R3254095
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	24-AUG-15	24-AUG-15	R3253479
Phenol (4AAP)							

* 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
L1660831-3 CHE-4							
Sampled By: SHELDON on 18-AUG-15 @ 09:30							
Matrix: WW							
Phenol (4AAP)							
Phenols (4AAP)	<0.0010		0.0010	mg/L	31-AUG-15	31-AUG-15	R3256906
Phosphorus, Total							
Phosphorus (P)-Total	0.017		0.010	mg/L		28-AUG-15	R3255661
Sulfate in Water by IC							
Sulfate (SO4)	18.0		0.30	mg/L		21-AUG-15	R3254095
Total Alkalinity as CaCO3							
Alkalinity, Total (as CaCO3)	61.2		1.0	mg/L		01-SEP-15	R3258711
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0607		0.0050	mg/L	25-AUG-15	25-AUG-15	R3253582
Arsenic (As)-Total	0.00038		0.00020	mg/L	25-AUG-15	25-AUG-15	R3253582
Cadmium (Cd)-Total	0.000013		0.000010	mg/L	25-AUG-15	25-AUG-15	R3253582
Calcium (Ca)-Total	16.7		0.10	mg/L	25-AUG-15	25-AUG-15	R3253582
Chromium (Cr)-Total	<0.0010		0.0010	mg/L	25-AUG-15	25-AUG-15	R3253582
Cobalt (Co)-Total	0.00032		0.00020	mg/L	25-AUG-15	25-AUG-15	R3253582
Copper (Cu)-Total	0.00583		0.00020	mg/L	25-AUG-15	25-AUG-15	R3253582
Iron (Fe)-Total	0.28		0.10	mg/L	25-AUG-15	25-AUG-15	R3253582
Lead (Pb)-Total	0.000152		0.000090	mg/L	25-AUG-15	25-AUG-15	R3253582
Magnesium (Mg)-Total	4.90		0.010	mg/L	25-AUG-15	25-AUG-15	R3253582
Manganese (Mn)-Total	0.00305		0.00030	mg/L	25-AUG-15	25-AUG-15	R3253582
Nickel (Ni)-Total	0.0032		0.0020	mg/L	25-AUG-15	25-AUG-15	R3253582
Potassium (K)-Total	3.23		0.020	mg/L	25-AUG-15	25-AUG-15	R3253582
Sodium (Na)-Total	31.2		0.030	mg/L	25-AUG-15	25-AUG-15	R3253582
Zinc (Zn)-Total	0.0026		0.0020	mg/L	25-AUG-15	25-AUG-15	R3253582
Total Suspended Solids							
Total Suspended Solids	<5.0		5.0	mg/L		24-AUG-15	R3253983
pH							
pH	7.36		0.10	pH units		01-SEP-15	R3258711

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLM	Detection Limit Adjusted due to sample matrix effects.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.

Test Method References:

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

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

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

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

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

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

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

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

BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B

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

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

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

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

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

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.

ETL-HARDNESS-TOT-WP	Water	Hardness Calculated	HARDNESS CALCULATED
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.

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.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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	F2-F4 PHC method	CWS (CCME)

Petroleum Hydrocarbons (F2-F4) in Water Method is adapted from US EPA Method 3511: Organic Compounds in Water by Micro-extraction" (Nov 2002) with instrumental analysis as per the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method" (CCMS, Dec 2000) Water samples (in their entirety) are extracted using hexane prior to capillary column gas chromatography with flame ionization detection (GC/FID).

FC-MPN-WP	Water	Fecal Coliform	APHA 9221E

The Most Probable Number (MPN) method is based on the Multiple Tube Fermentation technique. The results of examination of replicate tubes and dilutions of a sample are reported after confirmations specific to total coliform, fecal coliform and E. coli are performed. Results are reported in MPN/100 mL for water and MPN/gram for food and solid samples.

HG-T-CVAF-WP	Water	Mercury Total	EPA245.7 V2.0

Mercury in filtered and unfiltered waters is oxidized with Bromine monochloride and analyzed by cold-vapour atomic fluorescence spectrometry.

MET-T-L-MS-WP	Water	Total Metals by ICP-MS	APHA 3030E/EPA 6020A-TL

This analysis involves preliminary sample treatment by hotblock acid digestion (APHA 3030E). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

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.

OGG-TOT-WT	Water	Oil and Grease, Total	APHA 5520 B

Sample is extracted with hexane, extract is then evaporated and the residue is weighed to determine total oil and grease.

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

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

PAH,PANH-WP	Water	Polyaromatic Hydrocarbons (PAHs)	EPA SW 846/8270-GC/MS

Water is spiked with a surrogate spike mix and extracted using solvent extraction techniques. Analysis is performed by GC/MS in the selected ion monitoring (SIM) mode.

PH-WP	Water	pH	APHA 4500H

The pH of a sample is the determination of the activity of the hydrogen ions by potentiometric measurement using a standard hydrogen electrode and a reference electrode.

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WP	Water	Sulfate in Water by IC	EPA 300.1 (mod)

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

SOLIDS-TOTSUS-WP	Water	Total Suspended Solids	APHA 2540 D (modified)

Total suspended solids in aquesous matrices is determined gravimetrically after drying the residue at 103 105°C.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
TOC-WT	Water	Total Organic Carbon	APHA 5310B
Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.			
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:

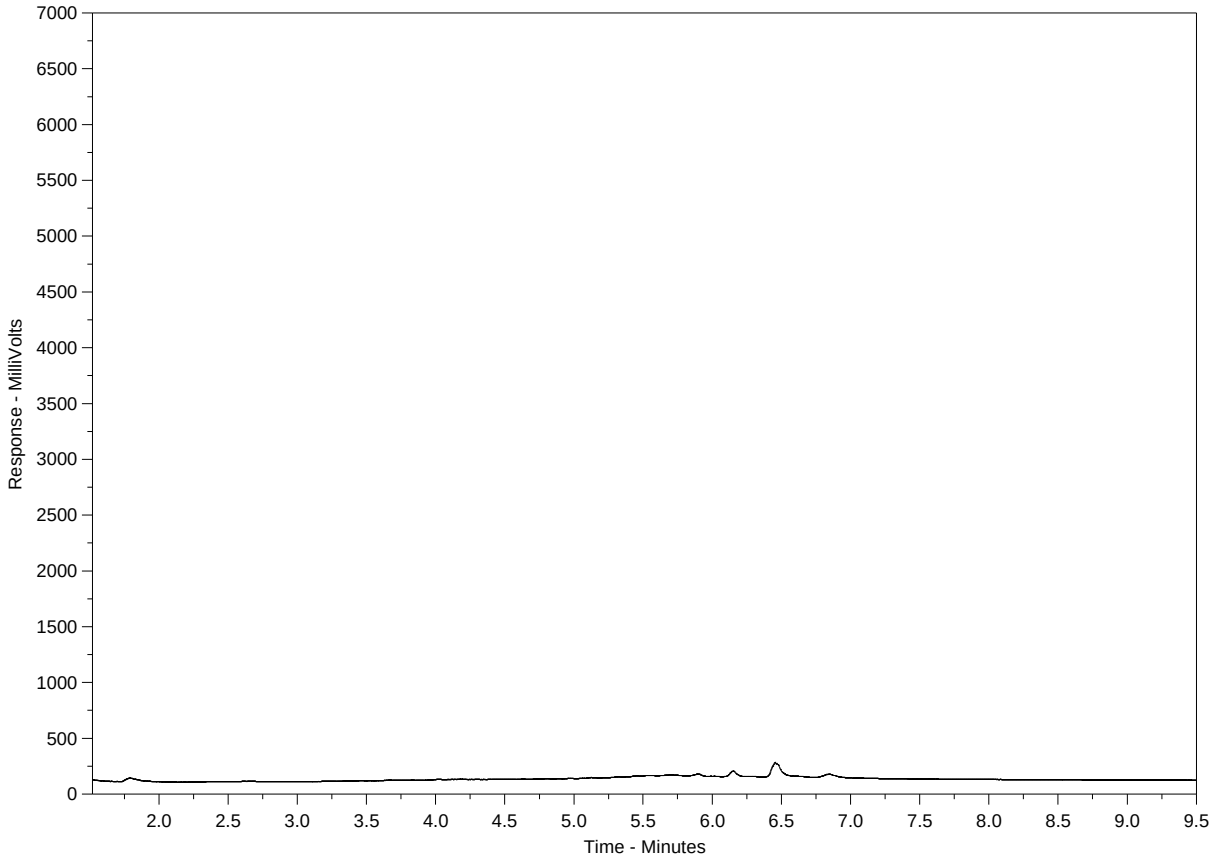
GLOSSARY OF REPORT TERMS

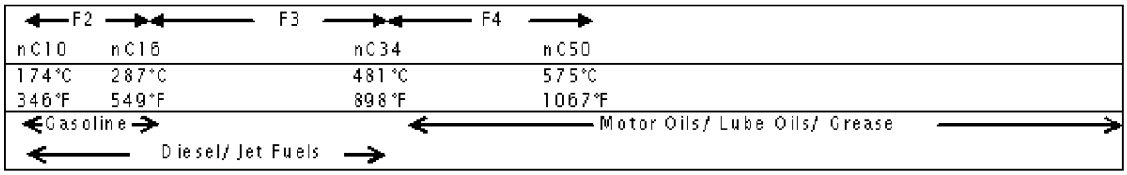
Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates 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: L1660831-1
Client Sample ID: CHE-2





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

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

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

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

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1660831-COFC

COC Number: 14 - 454534

Page 1 of 1

Report To		Report Format / Distribution		Turnaround Time (TAT) (Rush Turnaround Time (TAT) is not available for all tests)	
Company:	Hamlet of Chesterfield Inlet	Select Report Format:	PDF EXCEL EDD (DIGITAL)	R	Regular (Standard TAT if received by 3pm)
Contact:	Rick Van Horne	Quality Control (QC) Report with Report	Yes No	P	Priority (2-4 business days if received by 3pm)
Address:	P.O. Box 10 Chesterfield Inlet, NU X0C 0B0	Criteria on Report - provide details below if box checked		E	Emergency (1-2 business days if received by 3pm)
		Select Distribution:	EMAIL MAIL FAX	E2	Same day or weekend emergency if received by 10am – contact ALS for surcharge.
Phone:	(867) 898-9926	Email 1 or Fax	sao_hamlet@qiniq.com	Specify Date Required for E2,E or P:	
		Email 2	mlusty@gov.nu.ca		

Invoice To		Invoice Distribution	
	Same as Report To: Yes No	Select Invoice Distribution:	EMAIL MAIL FAX
	Copy of Invoice with Report: Yes No		
Company:		Email 1 or Fax	
Contact:		Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Hamlet of Chesterfield Inlet Monitoring Station	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact: Craig Riddell	Sampler: Sheldon

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Routine	BOD	DMetals	Phenols	Nutrients	Oil + Grease(x2)	DBacteria	DMercury	PAH	BTEX-F1(x3)	F2-F1(x2)			Number of Containers
	CHE-2	18,08,2015	9:50am	wastewater	√	√	P	P	P	P	P	P	P	P	P			15
	CHE-3	18,08,15	10:30 am	waste water	√	√	P	P	P	P	P	P						9
	CHE-4			wastewater	√	√	P	P	P	P	P	P						9
		18,08,205	9:30am															

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☒ No	WW-NUNAVUT-GRP1-PAH-F1-F4
Are samples for human drinking water use? ☐ Yes ☒ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen	☐	SIF Observations	Yes ☐	No ☐	
Ice packs	Yes ☐	No ☐	Custody seal Intact	Yes ☐	No ☐
Cooling Initiated	☐				

INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C	
12			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
Sheldon	18,08,205	1:00PM		20/8/16	1:00			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-05264 v08 From:03 October 2013

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.

Field Log

Name of Sampler(s): She Hon

Date of Sampling: 18,08,2015

Time of Sampling: 9:50 am

Monitoring Station Number: CHE-2

GPS Coordinates: N 63 ° 20 ' 785 " W 90 ° 45 ' 325 "

Weather Conditions: Good / Dry

Samples:

- [X] 500 mL BOD
- [X] 1 L Routine
- [X] 250 mL Metals + Pres
- [X] 40 mL Glass Mercury Vial + Pres
- [X] 250 mL Amber Nutrients + Pres
- [X] 250 mL Amber Phenols + Pres
- [X] 125 mL Sterile Bacteria Bottle
- [X] **2 x** 500 mL Glass Oil & Grease + Pres
- [X] 1 L Amber PAH + Pres
- [X] **3 x** 40 mL BTEX, F1 Vials + Pres
- [X] **2 x** 60 mL Amber F2-F4 Vials + Pres

Other:

- [ ] _____
- [ ] _____
- [ ] _____

Other Notes: (any unusual conditions, any deviation from standard procedures, etc.)

Field Log

L1660831-COFC

Name of Sampler(s): Sheldon

Date of Sampling: 16.08.2015

Time of Sampling: 10:30 am

Monitoring Station Number: CHE-3

GPS Coordinates: N 63 ° 20 ' 677 " W 90 ° 45 ' 074 "

Weather Conditions: Good / Dry

Samples:

- [X] 500 mL BOD
- [X] 1 L Routine
- [X] 250 mL Metals + Pres
- [X] 40 mL Glass Mercury Vial + Pres
- [X] 250 mL Amber Nutrients + Pres
- [X] 250 mL Amber Phenols + Pres
- [X] 125 mL Sterile Bacteria Bottle
- [X] **2 x** 500 mL Glass Oil & Grease + Pres
- [ ] 1 L Amber PAH + Pres
- [ ] **3 x** 40 mL BTEX, F1 Vials + Pres
- [ ] **2 x** 60 mL Amber F2-F4 Vials + Pres

Other:

- [ ] _____
- [ ] _____
- [ ] _____

Other Notes: (any unusual conditions, any deviation from standard procedures, etc.)

_____

_____

_____

_____

_____

Field Log

L1660831-COFC

Name of Sampler(s): Sheldon

Date of Sampling: Aug, 18, 2015

Time of Sampling: ~~11:00 am~~ 9:30 am

Monitoring Station Number: CHE-4

GPS Coordinates: N 63 ° 20 ' 993 " W 90 ° 43 ' 601 "

Weather Conditions: Good / Dry

Samples:

- [X] 500 mL BOD
- [X] 1 L Routine
- [X] 250 mL Metals + Pres
- [X] 40 mL Glass Mercury Vial + Pres
- [X] 250 mL Amber Nutrients + Pres
- [X] 250 mL Amber Phenols + Pres
- [X] 125 mL Sterile Bacteria Bottle
- [X] **2 x** 500 mL Glass Oil & Grease + Pres
- [ ] 1 L Amber PAH + Pres
- [ ] **3 x** 40 mL BTEX, F1 Vials + Pres
- [ ] **2 x** 60 mL Amber F2-F4 Vials + Pres

Other:

- [ ] _____
- [ ] _____
- [ ] _____

Other Notes: (any unusual conditions, any deviation from standard procedures, etc.)

Hazardous Materials Spill Database

Environment Division of ENR
Scotia 6, 5102-50th Avenue; Yellowknife, NT X1A 3S8
Phone: (867) 873-7654 Fax: (867) 873-0221

Sorted By: SpillNo for the year(s): 2015

Spill No.	Date	Ter	Region	Location	Site Description	Commodity	Quantity	Source	Agency
2015061	2015-02-21	NU	KEE	Chesterfield Inlet		Fuel Oil	0 L	ST<	EPS
2015274	2015-06-25	NU	KEE	Chesterfield Inlet	Chesterfield Inlet	Heating Fuel	150 L	ST<	GN

Total Spills on this Report: 2

This report contains information regarding spills that were reported to the NWT 24-Hour Spill Line. The absence of information on any particular location in no way guarantees that contamination has not occurred at that location.

LEGEND

Region:
BAF - Baffin
DEH - Deh Cho
INU - Inuvik
KEE - Keewatin
KIT - Kitikmeot
NSL - North Slave
SAH - Sahtu
SSL - South Slave

Source:
AIR - Aircraft
DRUM - Drum or Barrel
MV - Marine Vessel
NS - Natural Seepage
OTH - Other Transportation
PL - Pipe or Line
RT - Rail Train
SL - Sewage Lagoon
ST< - Storage Tank <4000 litres
ST> - Storage Tank >4000 litres
TP - Tailings Pond
TRU - Truck
UK - Unkown
WELL - Wet Wells, Flaring
Boom

Agency:
CCG - Canadian Coast Guard
EP - Environment Canada
GN - Government of Nunavut
GNWT - Government of Northwest Territories
ILA - Inuvialiut Land Administration
INAC - Indian and Northern Affairs Canada
NEB - National Energy Board

Aboriginal Affairs and Northern Development Canada | Affaires autochtones et Développement du Nord Canada

WATER LICENCE INSPECTION FORM

☐ Original
☐ Follow-Up Report

Licensee	Licensee Representative
Hamlet of Chesterfield Inlet	Richard Vah Horne
Licence No. / Expiry	**Representative's Title**
3BM-CHE1523	Senior Administrative officer
Land / Other Authorizations	**Land / Other Authorizations**
Date of Inspection	**Inspector**
28/07/2015	Atuat Shouldice

Activities Inspected

☐ Camp ☐ Drilling ☐ Mining ☐ Construction ☐ Reclamation ☒ Fuel Storage
☐ Roads/Hauling ☒ Other: Water Discharge ☒ Other:Water use /Deposit of waste

Conditions: A - Acceptable C - Concern U - Unacceptable NA – Not Applicable NI – Not Inspected

Water Use	Condition	Comment	Site Conditions	Condition	Comment	Haz/Mat Management	Condition	Comment
Intake/Screen	A		Water Management Structures	A		Storage	A	
Flow Measure. Device	A	1	Culverts / Bridges	A		Spills	A	
Source:	A		Drainage	A		Spill Plan	A	
Water Use:	A		Erosion / Sediment	A				
Recirculation (y /n)	Y		Mitigation Measures	A		**Administrative**		
			Reclamation Activities	A		Records	A	
			Materials Storage	A		Reports	A	
Waste Disposal			Signage	A		Plans	A	
Waste Water	A					Notifications	C	
Solid Waste	A		**Monitoring**			**Other**		
Hazardous Waste	A		Sample Collection / Analysis	NI				

**The number in the comments field will correspond with specific comments provided below.*

Samples taken by Inspector:	Location(s): Chesterfield Inlet
☐ Yes ☒ No	

SECTION 1 ☐ Comments (s.__) ☐ Non-Compliance with Act or Licence (s.__) ☐ Action Required (s.__)

A compliance inspection was conducted July 28th 2015 of Hamlet of Chesterfield Inlet.

SECTION 2 ☒ Comments (s.__) ☐ Non-Compliance with Act or Licence (s.__) ☐ Action Required (s.__)

A flow meter was installed during the filling on the Water Lagoon; issues with placement of the pump may have not given an accurate reading to find the total amount during recharge of lagoon.

Inspector requested that all waste oil drums be palletized and capped in order to stop the spreading on contaminates.

Two Sewage discharge point were inspected, only one is being used because of location and prevailing wind direction. No concerns noted.

The landfill was inspected; Items in landfill have started to be segregated. Fencing falling in some areas. No concerns noted

SECTION 3 ☐ Comments (s.__) ☐ Non-Compliance with Act or Licence, (s.__) ☒ Action Required (s.__)

The Hamlet of Chesterfield Inlet have been following the yearly goals of the water licence working compliance group in relation to the use of water and deposit of waste.

The inspector requests that the drums be Palletized and capped before the next municipal inspection of 2016.

Licensee or Representative	Inspector's Name
	Atuat Shouldice
Signature	**Signature**
Date	**Date**
	03/03/16

Office Use Only: Follow-up report to be issued by Inspector ☐ Yes ☐ No

Canada