ANNUAL REPORT
FOR THE HAMLET OF RANKIN INLET

YEAR BEING REPORTED: 2014

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water Licence No. **3BM-RAN1214** issued to the **Hamlet of Rankin 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 RAN-2.

Month Reported	Quantity of Water Obtained from all sources (m^3)	Quantity of Sewage Waste Discharged (Estimated)
January	none	none
February	none	none
March	none	none
April	none	none
May	none	none
June	none	none
July	none	none
August	none	none
September	none	none
October	none	none
November	none	none
December	none	none
ANNUAL TOTAL	none	none

Note: The purpose of this Licence is the deposit of waste; there is no authorized water use.

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;

- During summer 2014, waste was covered with gravel and compacted with an excavator and a D6 CAT.
- A fence and gate was installed at the entry to the Solid Waste Site in September 2014. The gate is locked outside of the Solid Waste Site hours of operation from 9 am to 5 pm, Monday to Friday, to restrict access to the site.

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

Spills:

- 2014128, 2014-09-08, 12-12 Igloo Street, P50 Heating Oil, 1000 L
- 2014174, 2014-05-20, Illagiktut Center, Apartment building, P50, 200 L
- 2014180, 2014-05-27, Rankin Inlet Unit 426, Heating Diesel Fuel, 800 L
- 2014199, 2014-06-04, 33 Plex, Adjacent to Healing Facility, P-50, 30 L
- 2014204, 2014-05-05, Rankin Inlet, Heating diesel Fuel, 325 L
- 2014232, 2014-06-24, Rankin Inlet, Heating Fuel Diesel, 0 L
- 2014275, 2014-07-29, IBSL Leasing LTD Duplex, P-50, 200 L
- 2014308, 2014-08-22, Kivalliq Hall, Propylene Glycol, 0 L
- 2014354, 2014-10-01, Rankin Inlet, Diesel, 800 L
- 2014404, 2014-11-07, 163 Mivvik Ave, Furnace Fuel, 60 L
- 2014445, 2014-12-11, Rankin Inlet, Fuel Oil, 75 L

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 2014.
- Sampling of the soil in the landfarm will be done summer 2015 to determine if the soil meets CCME guidelines and can be removed from the facility. If soil meets guidelines, approval from the NWB will be sought for an Abandonment and Restoration Plan for the landfarm. The Licensee wishes to decommission the landfarm and remove the landfarm as part of the municipal Licence. The Abandonment and Restoration Plan will be submitted to the NWB a minimum of six (6) months prior to abandoning the facility.

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;

- Water Licence No. 3BM-RAN1214 Amendment/Renewal Application was submitted to the NWB on March 5, 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 2015. Pictures of the signage at Monitoring Program Stations will be included in the 2015 Annual Report.
- Water Licence No. 3BM-RAN1214 contains many conditions related to the new Solid Waste Site. There are currently no plans to commission this site and the Licensee has requested that these conditions be removed from the Licence in the Amendment/Renewal Application. If there are plans to commission a new site in the future, an Amendment Application will be submitted to the NWB for approval of the new site and of the abandonment and restoration of the existing Solid Waste Site.

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

- The *Solid Waste Management Facility Operation and Maintenance (O&M) Plan* and *Environmental Emergency Contingency Plan, Hamlet of Rankin Inlet* prepared by Nuna Burnside, December 2009 are currently being reviewed and updated. The updated plans will be submitted to the NWB by August 31, 2015. A summary of modifications will be included in the 2015 Annual Report in the form of an addendum.

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

- The only Monitoring Program Station that was sampled in 2014 was RAN-2. Please refer to the following table for a summary of why other stations were not sampled.

Monitoring Program Station Number	Description	Status	2014 Sampling
RAN-1	Unassigned	Inactive	*Sampling not required*
RAN-2	Runoff from the Old Landfill	Active	*Sampled August 6, 2014*
RAN-3	Runoff from the New Landfill	Active Upon Commissioning	*New Landfill not commissioned – sampling not required*
RAN-4	Discharge from the Landfarm Facility at the controlled point of release	Active	*No discharge from the Landfarm – no sampling*
RAN-5	Monitoring well located up gradient of the Landfarm	Active	*No monitoring well installed – unable to sample*
RAN-6	Monitoring well located down gradient of the Landfarm	Active	*No monitoring well installed – unable to sample*

- No soil entered the landfarm in 2014 (to be recorded as per Part H, Item 4).
- No soil was removed from the landfarm in 2014 (to be recorded as per Part H, Item 6).
- All sampling required under the Monitoring Program will be completed during the 2015 sampling season. The weekly Monitoring Station check will begin May and continue until the end of August.

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

- AANDC Inspection took place on August 19, 2014. See Appendix B for the Inspection Report.
- Water Licence No. 3BM-RAN1214 Amendment/Renewal Application was submitted to the NWB on March 5, 2015.

- The Hamlet of Rankin Inlet Plan for Compliance was submitted to the NWB on March 5, 2015.
- The *Environmental Monitoring Program and Quality Assurance/Quality Control Plan, Hamlet of Rankin Inlet* was prepared by Nuna Burnside, December 2008 and submitted to the NWB with the 2009 Renewal Application. This QA/QC Plan is currently being updated and will be sent to an accredited laboratory to confirm acceptance. The updated QA/QC Plan, including cover letter from accredited laboratory, will be submitted to the NWB by April 30, 2015.

List of Appendixes

Appendix A: Hazardous Materials Spill Database, Rankin Inlet 2014 – 1 page
Appendix B: AANDC Inspection Report, July 7, 2014 – 5 pages
Appendix C: Monitoring Program Sampling Parameters Summary – 1 page
Appendix D: Certificate of Analysis, August 6, 2014 – 7 pages

Appendix A: Hazardous Materials Spill Database, Rankin Inlet 2014

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): 2014

Spill No.	Date	Ter	Region	Location	Site Description	Commodity	Quantity	Source	Agency
2014128	2014-09-08	NU	KEE	Rankin Inlet	12-12 Igloo Street	P50 heating oil	1000 L	ST<	GN
2014174	2014-05-20	NU	KEE	Rankin Inlet	LIAgiktut Center, Apartment building, Rankin Inlet	P-50	200 L	ST<	GN
2014180	2014-05-27	NU	KEE	Rankin Inlet	Rankin Inlet Unit 426	Heating Diesel Fuel	800 L	ST<	GN
2014199	2014-06-04	NU	KEE	Rankin Inlet	33 Plex Rankin Inlet. Adjacent to Healing Facility	P-50	30 L	ST<	GN
2014204	2014-06-05	NU	KEE	Rankin Inlet	Rankin Inlet	Heating diesel Fuel	325 L	PL	GN
2014232	2014-06-23	NU	KIT	Rankin Inlet	Rankin Inlet	Heating Fuel Diesel	0 L	ST<	GN
2014275	2014-07-29	NU	KEE	Rankin Inlet	IBSL Leasing LTD. Duplex	P-50	200 L	ST<	GN
2014281	2014-07-29	NU	KEE	Rankin Inlet	IBSL Leasing LTD.- Duplex FILE CLOSED	P-50	200 L	ST<	GN
2014308	2014-08-22	NU	KEE	Rankin Inlet	Kivalliq Hall	Propylene Glycol	0 L	PL	GN
2014354	2014-10-01	NU	KEE	Rankin Inlet	Rankin Inlet	Diesel	800 L	ST<	GN
2014404	2014-11-07	NU	KEE	Rankin Inlet	163 Mivvik Ave	Furnace Fuel	60 L	ST<	GN
2014445	2014-12-11	NU	KEE	Rankin Inlet	Rankin Inlet	Fuel Oil	75 L	PL	EPS

Total Spills on this Report: 12

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

Appendix B: AANDC Inspection Report, July 7, 2014

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 Rankin Inlet	Justin Merrit (A/SAO), Joe Kaludjak (Hamlet Foreman), Megan Lusty (CGS)
Licence No. / Expiry (DD/MM/YYYY)	**Representative's Title**
3BM-RAN1214 (31/05/14)	----------
Date of Inspection (DD/MM/YYYY)	**Inspector**
19/08/14	WRO C. Wilson

Activities Inspected

☐ Camp ☐ Drilling ☐ Mining ☐ Construction ☐ Reclamation ☐ Fuel Storage
☐ Roads/Hauling ☐ Other: ☒ Other: **MUNICIPAL UNDERTAKING**

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
Source:	NA		Water Management Structures	U	2	Storage	U	6,8
Intake/Screen	NA		Drainage	A	2	Spills	U	9
Flow Measure. Device	NA		Signage	U	10			
Water Use:	NA		infrastructure	A	5			
Recirculation (y /n)	NA		Landfarm	U	4	**Administrative**		
						Records	U	12
						Reports	U	-
Waste Disposal						Plans	U	1
Waste Water	A	2				Revisions	U	-
Solid Waste	U	3	**Monitoring**			**Other**		
			Sample Collection	U	11-13	Notification	U	15
			Analysis	U	14	Authorization	U	16

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

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

SECTION 1 ☒ **Comments** (s._1_) ☐ **Non-Compliance with Act or Licence** (s.__) ☐ **Action Required** (s.__)

File Synopsis

This licence is issued by the Nunavut Water Board (the Board) to the Hamlet of Rankin Inlet for the deposit of waste in a municipal landfill (located at 62 48' 03.4" N, 92 04' 22.0" W) and landfarm facility (located at 62 49' 49.8" N, 92 10' 16.2" W).

In 2012 a renewal licence was issued to the Hamlet for the short term of two years due to outstanding compliance issues, one of which was failure to comply with an AANDC Inspector's direction that was issues in 2008. Additional, the Hamlet failed to submit, a Compliance Plan which identifies and addressed ongoing compliance issues and a number of revisions to Plans submitted with the renewal application. The Board incorporated the compliance plan and revisions/submissions into the terms and conditions of 3BM-RAN1214.

The entire list of requirements the Board identified during the decision process can be found from PG 2-7 under the heading "Decision" of the licence. For the purpose of this inspection report the applicable outstanding issues have been paraphrased below;

- A revision to the Solid Waste Management Facility Operation and Maintenance (O and M) Plan to address the requirements under Part F, Item 2 of the licence. The revised plan is required within ninety (90) days of licence issuance.
- A revision to the Environmental Emergency Contingency Plan (EECP) to address the requirements under Part F, Item 3 of the licence. The revised plan is required within ninety (90) days of licence issuance.
- Submit a Quality Assurance / Quality Control (QA/QC) Plan to an analyst for approval. Upon approval, the licensee is required to provide the Board with a covering letter from the accredited laboratory and analyst, confirming acceptance of the Plan for the analyses to be performed under this Licence.
- Submit a Landfarm Operational Contingency (LOC) Plan outlining the measures that will be taken should seepage become an issue. The contingency plan is to be included as part of the addendum to the EECP due within ninety (90) days of licence issuance.

With three additional requirements specific to the landfarm;

- Have a qualified engineer undertake an annual geotechnical inspection to report on structural integrity and make recommendations on remedial works, where required.
- Install groundwater monitoring wells, with one located up-gradient and one down-gradient of the facility
- Submit stamped as-built drawings of the facility following the first geotechnical inspection in 2012 and installation of the groundwater monitoring wells.

None of the above requirements were met as of August 19th, 2014.

Canada

Pre Inspection Meeting Notes

Participants in the meeting were acting SAO Justin Merrit, Hamlet Foreman Joe Kaludjak, Hamlet of Rankin Inlet; Municipal Engineer Megan Lusty, Community Government Services, Government of Nunavut and inspecting Water Resource Officer C. Wilson, Aboriginal Affairs and Northern Development (AANDC), Government of Canada.

3BM-RAN1214 expired on May 31st 2014. A discussion based around the licensing process and requirements of the licence led the meeting. Information was requested by the A/SAO which could assist the Hamlet Council with decisions regarding resources required for the water licensing process. It was identified that a Plan was required between CGS and the Hamlet as to who would lead the water licence renewal process, annual reporting, and monitoring program objectives. The Hamlet recommended a meeting to be held with the new SAO, CGS and the Inspector to provide information directly to the Hamlet councillors. The Inspector concurs with the Hamlets recommendation.

Additional notes from the discussion and follow up;

-No progress has been made on the renewal application for the Hamlet of Rankin Inlet water licence.

-The Hamlet has not initiated any work on the new landfill or the decommissioning of the old landfill including the development of an Abandonment and Reclamation Plan for the old Landfill.

-The Hamlet discussed a plan to have the current Landfill compacted with a crusher. No specific details were provided to the Inspector. No information has been provided to the Board.

-The Hamlet has proposed to lock the Landfill facility when the new fence is in place to allow for proper management of the facility. The Hamlet council must vote whether locking the gate will be implemented this coming summer 2015.

- The Hamlet has been crushing old empty drums and palletizing them within the Landfill.

-In 2010 CGS contracted a consultant to sample the soil in the Hamlet's Landfarm and to determine the remaining remediation required.

Additional note: The Inspector met with Jason Tologanak, Regional Director Community Government Services in 2012 after the discovery of a breech in the berm wall of the Hamlet's Landfarm facility. Mr. Tologanak provided the sampling results for 2010 of the soil in the facility and identified the decommissioning of the facility as a priority due to a number of compliance issues.

According to the criteria set out in Section 5.1.2 of the Solid Waste Management Facility, Operations and Maintenance (O and M) Plan, Hamlet of Rankin Inlet, dated December 2008, the soil represented in the 2010 samples appears to have reached a remedial objective for soils used as Landfill cover. The Hamlet is reminded that remediated soil from the Landfarm must be sampled as per the QA/QC Plan and by a third party with the sampling results provided to Government of Nunavut's department of Environment Protection Service for discharge approval. Furthermore the 2012 annual report noted a Decommissioning Plan which will be implemented in 2014. This Plan is not available for review at the time of the inspection.

WASTE DISPOSAL

1) The Rankin Inlet Landfill experienced a number of fires within the facility this year. The community fire department extinguished the fires using cover and fresh water.
2) The waste water from the Landfill is contained in two small ponded areas located at the rear of the facility (Photo 1).

SITE CONDTION

3) The Landfill is lacking segregation. Areas have been designated inside the facility for bulky non-metals, and sewage screenings.
4) The Landfarm is not being operated as per the section 5.1 Solid Waste Management Facility Operations and Maintenance (O and M) Plan, Hamlet of Rankin Inlet, dated December 2008. During the inspection the Hamlet indicated no water has ever been discharged from the facility nor has any remedial work been completed by the Hamlet.
5) The Hamlet has installed a fence at the entrance of the landfill.
6) Contaminated soil is being stored in wooden crates at the landfill. The Hamlet of Rankin Inlet is reminded it cannot accept hazardous waste such as contaminated soil at the landfill. As per the O and M Plan this facility is for domestic waste and the hazardous materials are to be stored temporarily.
7) The Hamlet recently started sorting hazardous waste like batteries and propane cylinders. CGS representative has indicated a possibility of providing proper storage bags for batteries and training on safe handling of hazardous waste.

HAZARDOUS WASTE MANAGEMENT

8) Though progress has been made on sorting new hazardous waste the historical waste found inside the landfill remains an issue. 300 plus drums of unknown materials are found lining the entrance road of the dump. It was noted that drums are being crushed and palletized.
9) Contaminated soil has been historically deposited into the landfill, the Hamlet is aware that this activity is unacceptable. The party responsible for the contaminated soil is inevitable responsible for the soil treatment. The Hamlet is encouraged to report dumping to the Environment Protection Officers- GN. Recently CGS has started accepting contaminated soils into their landfarm (water licence 1BR-RAN0914) which is across the street from the Hamlet's Landfarm.

MONITORING

10) The Hamlet is lacking signs which identify the monitoring program sampling locations as required under Part H item 1
11) The Hamlet's Foreman, with coordination from CGS, has been completing the sampling for RAN-2. Currently this is the only sampling location that is being monitored.
12) The Hamlet is required to measure, record and characterize the materials entering the Landfarm as per PART H item 4 and 5. This information is not available for review during the inspection.
13) Groundwater monitoring wells at the Landfarm Facility were never installed therefore no samples have been taken as per

PART H item 1.

14) The Hamlet failed to submit a QA/QC Plan which is to include a Lab accreditation letter therefore failing to meet all the requirements of the Monitoring section of this Licence.

ADMINISTRATIVE

15) The Licence expired May 31st, 2014
16) The Hamlet has been operating the waste management facilities without a current license since May 31st, 2014
17) Annual report as required under PART B item 1 is outstanding for 2013.

OTHER

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

PART B item 5- Failure to maintain signage which identifies sampling locations
PART B item 10- Failure to submit a compliance plan in 30 days of licence issuances
PART B item 12- Failure to fully implement all Plans associated with this licence
PART B item 13- Failure to carry out the Plans pursuant to the terms and conditions of this licence
PART B item 14- Failure to review Plans and modify them accordingly. This referred specifically to the Plans regarding the use of the new Landfill.
Part C item 4- Failure to store hazardous waste in such a way to prevent the deposit of deleterious substance into water.
PART D item 4- Failure to segregate and store all hazardous waste in a manner to prevent the deposit of deleterious substances into any water.
PART D item 6- Failure to treat all contaminated soils in the Landfarm
PART F item 1- Failure to submit revisions to O and M
PART F item 4- Failure to carry out geotechnical inspection on waste management facilities.
PART H item 1- Failure to maintain monitoring program stations
PART H item 4- Failure to measure and record the amount of material entering the Landfarm
PART H item 5- Failure to characterize soils that enter the Landfarm
PART H item 13- Failure to maintain Lab accreditation records
PART H item 14- Failure to submit a QA/QC Plan
PART H item 16- Failure to include sampling results in Annual Report

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

- The Hamlet will provide all sampling data collected for 2014 to the inspector before December 31st, 2014.
- The Hamlet will provide the QA/QC Plan as required by this License before December 31st, 2014. This document is required to ensure proper measures are being taken during the sampling for the monitoring program.
- The Hamlet SAO and CGS representatives will contact the inspector 60 days after November 30th, 2015 to discuss the Landfarm, new landfill and the renewal application.

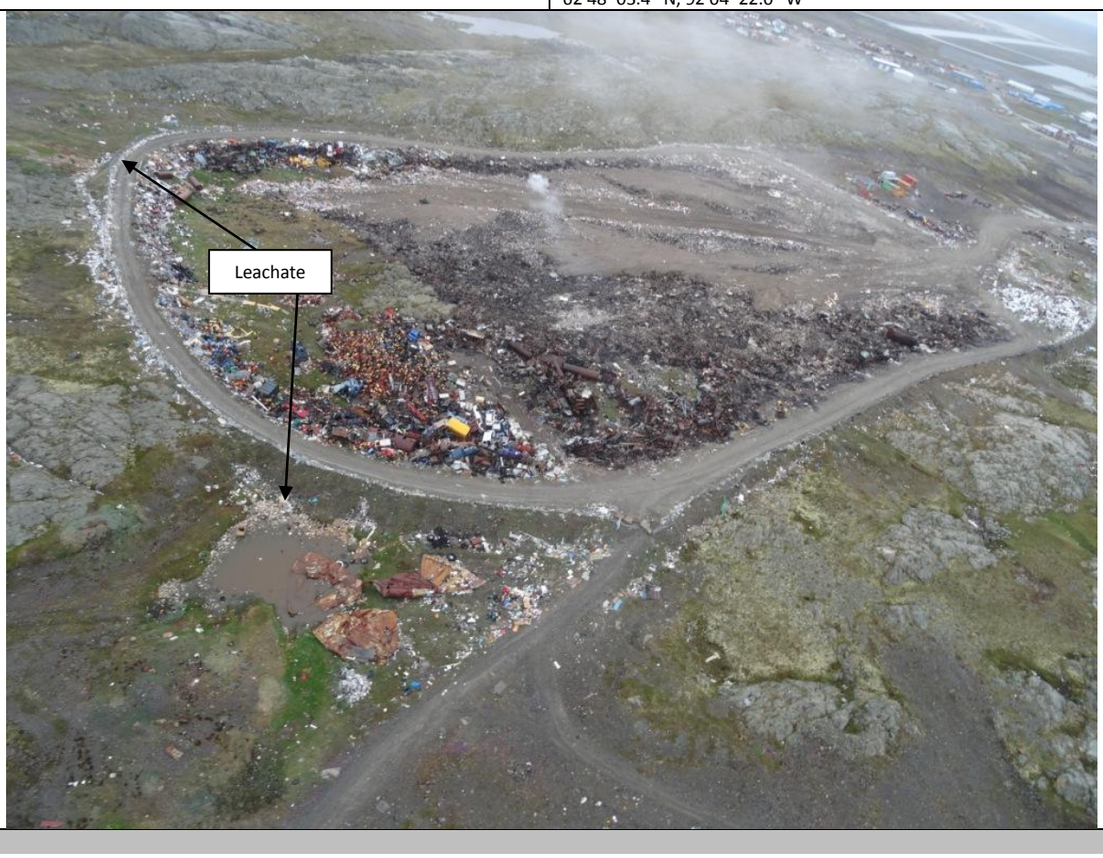
The current licence scope does not accurately reflect the plans for the waste management facility in Rankin Inlet. The new landfill requires a number of improvements before commissioning though the Plans submitted during the 2012 renewal of this licence only discuss the new landfill facilities therefore providing no direction to the current facility. **The Hamlet will immediately initiate assistance from CGS to complete the beginning discussions on the renewal application for the water licence. A copy of this letter will be provided to the Inspector via email on later than December 15th, 2014. Failure to fulfill the actions identified above will result in further enforcement measures.**

Licensee or Representative	**Inspector's Name**
	Christine Wilson
Signature	**Signature**
	Originally signed on file
Date	**Date**

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

PHOTO LOG			
Date:	**Authorization Number:**	**Camera/Model:**	**Inspector**
08/19/2014	3BM-RAN0914	Sony DSC-HX50V Cyber shot	WRO Wilson

Location name:	**Lat/Long (DD.MM.SS.SS, NAD83)**
Photo 1	62 48’ 03.4” N, 92 04’ 22.0” W



Desciption:
Rankin Inlet Municipal Landfill. (Ariel Photo was taken at a different time from the inspection date)

Location name:	**Lat/Long (DD.MM.SS.SS, NAD83)**
Photo 2	62 49’ 49.8” N, 92 10’ 16.2” W

Desciption:
Hamlets Landfarm

Location name:	Lat/Long (DD.MM.SS.SS, NAD83)
Photo 3	62 48’ 03.4” N, 92 04’ 22.0” W

Desciption:

Rankin Inlet Landfill. Drum storage area.

Appendix C: Monitoring Program Sampling Parameters Summary

2014 Rankin Inlet Monitoring Station and Sampling Parameters Summary for Licence No. 3BM-RAN1214

			RAN-2	
Parameters	**Unit**	**Detection Limit**	**06-Aug-14**	**CCME Guideline[1]**
BOD	mg/L	6.0	<6.0	n/g
Total Suspended Solids	mg/L	5.0	12.0	
Conductivity	umhos/cm	20	3000	n/g
Oil and Grease	mg/L	2	<2.0	n/g
Total Hardness	mg/L	0.30	936	n/g
Chloride	mg/L	2.5	408	120
Ammonia Nitrogen	mg/L	0.10	2.61	1.54
Fecal Coliforms	MPN/100 mL	3	4	n/g
pH	pH units	0.10	8.10	6.5-9
Nitrate-Nitrite	mg/L	0.35	<0.35	n/g
Total Phenols	mg/L	0.0010	0.0060	0.004
Sulphate	mg/L	2.5	670	n/g
Total Alkalinity	mg/L	20	431	n/g
Total Aluminum	mg/L	0.0050	0.0486	0.1
Total Arsenic	mg/L	0.00020	0.00538	0.005
Total Cadmium	mg/L	0.000010	0.000077	0.000090
Total Calcium	mg/L	0.10	276	n/g
Total Chromium	mg/L	0.0010	0.0015	n/g
Total Cobalt	mg/L	0.00020	0.00463	n/g
Total Copper	mg/L	0.00020	0.00894	0.004
Total Iron	mg/L	0.10	4.42	0.3
Total Lead	mg/L	0.000090	0.000755	0.007
Total Magesium	mg/L	0.010	60.0	n/g
Total Manganese	mg/L	0.00030	2.04	n/g
Total Nickel	mg/L	0.0020	0.0219	0.15
Total Potassium	mg/L	0.02	57	n/g
Total Sodium	mg/L	0.03	358	n/g
Total Zinc	mg/L	0.002	0.0258	0.03

[1]Canadian Environmental Quality Guidelines - Water Quality Guidelines for the Protection of Aquatic Life
n/g - no guideline

Exceeds Guidelines for Protection of Aquatic Life

Appendix D: Certificate of Analysis, August 6, 2014

Hamlet of Rankin Inlet
ATTN: JUSTIN MERRITT
PO Box 310
Rankin Inlet NU X0C 0G0

Date Received: 07-AUG-14
Report Date: 20-AUG-14 15:00 (MT)
Version: FINAL

Client Phone: 867-645-2895

Certificate of Analysis

Lab Work Order #: L1498490

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

Gail Hill
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1498490-1 RAN-2							
Sampled By: Joe K on 06-AUG-14 @ 09:05							
Matrix: Water							
Miscellaneous Parameters							
Total Organic Carbon	50.2		1.0	mg/L	13-AUG-14	13-AUG-14	R2918089
F2-F4 PHC method							
F2 (C10-C16)	<0.25		0.25	mg/L	11-AUG-14	11-AUG-14	R2915017
F3 (C16-C34)	<0.25		0.25	mg/L	11-AUG-14	11-AUG-14	R2915017
F4 (C34-C50)	<0.25		0.25	mg/L	11-AUG-14	11-AUG-14	R2915017
Surrogate: 2-Bromobenzotrifluoride	93.1		60-140	%	11-AUG-14	11-AUG-14	R2915017
Polyaromatic Hydrocarbons (PAHs)							
1-Methyl Naphthalene	0.000122		0.000020	mg/L	12-AUG-14	12-AUG-14	R2923093
2-Methyl Naphthalene	0.000054		0.000020	mg/L	12-AUG-14	12-AUG-14	R2923093
Acenaphthene	<0.000020		0.000020	mg/L	12-AUG-14	12-AUG-14	R2923093
Acenaphthylene	<0.00010	DLM	0.00010	mg/L	12-AUG-14	12-AUG-14	R2923093
Anthracene	<0.000010		0.000010	mg/L	12-AUG-14	12-AUG-14	R2923093
Acridine	<0.000020		0.000020	mg/L	12-AUG-14	12-AUG-14	R2923093
Benzo(a)anthracene	<0.000010		0.000010	mg/L	12-AUG-14	12-AUG-14	R2923093
Benzo(a)pyrene	<0.0000050		0.0000050	mg/L	12-AUG-14	12-AUG-14	R2923093
Benzo(b&j)fluoranthene	<0.000010		0.000010	mg/L	12-AUG-14	12-AUG-14	R2923093
Benzo(g,h,i)perylene	<0.000020		0.000020	mg/L	12-AUG-14	12-AUG-14	R2923093
Benzo(k)fluoranthene	<0.000010		0.000010	mg/L	12-AUG-14	12-AUG-14	R2923093
Chrysene	<0.000020		0.000020	mg/L	12-AUG-14	12-AUG-14	R2923093
Dibenzo(a,h)anthracene	<0.0000050		0.0000050	mg/L	12-AUG-14	12-AUG-14	R2923093
Fluoranthene	<0.000020		0.000020	mg/L	12-AUG-14	12-AUG-14	R2923093
Fluorene	<0.000020		0.000020	mg/L	12-AUG-14	12-AUG-14	R2923093
Indeno(1,2,3-cd)pyrene	<0.000010		0.000010	mg/L	12-AUG-14	12-AUG-14	R2923093
Naphthalene	0.000062	EMPC	0.000050	mg/L	12-AUG-14	12-AUG-14	R2923093
Phenanthrene	<0.000050		0.000050	mg/L	12-AUG-14	12-AUG-14	R2923093
Pyrene	<0.000010		0.000010	mg/L	12-AUG-14	12-AUG-14	R2923093
Quinoline	<0.000020		0.000020	mg/L	12-AUG-14	12-AUG-14	R2923093
B(a)P Total Potency Equivalent	<0.000030		0.000030	mg/L	12-AUG-14	12-AUG-14	R2923093
Surrogate: Acenaphthene d10	71.3		40-130	%	12-AUG-14	12-AUG-14	R2923093
Surrogate: Acridine d9	74.1		40-130	%	12-AUG-14	12-AUG-14	R2923093
Surrogate: Chrysene d12	75.9		40-130	%	12-AUG-14	12-AUG-14	R2923093
Surrogate: Naphthalene d8	64.8		40-130	%	12-AUG-14	12-AUG-14	R2923093
Surrogate: Phenanthrene d10	67.1		40-130	%	12-AUG-14	12-AUG-14	R2923093
Nunavut WW Group 1							
Alkalinity							
Alkalinity, Total (as CaCO3)	431		20	mg/L		12-AUG-14	R2916228
Bicarbonate (HCO3)	526		24	mg/L		12-AUG-14	R2916228
Carbonate (CO3)	<12		12	mg/L		12-AUG-14	R2916228
Hydroxide (OH)	<6.8		6.8	mg/L		12-AUG-14	R2916228
Ammonia by colour							
Ammonia, Total (as N)	2.61	DLA	0.10	mg/L		11-AUG-14	R2915259
Biochemical Oxygen Demand (BOD)							
Biochemical Oxygen Demand	<6.0		6.0	mg/L		08-AUG-14	R2916590
Carbonaceous BOD							
BOD Carbonaceous	<6.0		6.0	mg/L		08-AUG-14	R2916590
Chloride by Ion Chromatography							
Chloride	408		2.5	mg/L		07-AUG-14	R2912221
Conductivity							
Conductivity	3000		20	umhos/cm		12-AUG-14	R2916228
Fecal Coliform							
Fecal Coliforms	4		3	MPN/100mL		10-AUG-14	R2915616
Hardness Calculated							

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1498490-1 RAN-2							
Sampled By: Joe K on 06-AUG-14 @ 09:05							
Matrix: Water							
Hardness Calculated							
Hardness (as CaCO3)	936		0.30	mg/L		15-AUG-14	
Mercury Total							
Mercury (Hg)-Total	<0.000020		0.000020	mg/L	08-AUG-14	08-AUG-14	R2912147
Nitrate as N by Ion Chromatography							
Nitrate-N	<0.25	DLM	0.25	mg/L		07-AUG-14	R2912221
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.35		0.35	mg/L		08-AUG-14	
Nitrite as N by Ion Chromatography							
Nitrite-N	<0.25	DLM	0.25	mg/L		07-AUG-14	R2912221
Oil and Grease, Total							
Oil and Grease, Total	<2.0		2.0	mg/L	10-AUG-14	10-AUG-14	R2916136
Phenol (4AAP)							
Phenols (4AAP)	0.0060		0.0010	mg/L	13-AUG-14	13-AUG-14	R2916719
Phosphorus, Total							
Phosphorus (P)-Total	0.089		0.010	mg/L		15-AUG-14	R2920326
Sulfate by Ion Chromatography							
Sulfate	670		2.5	mg/L		07-AUG-14	R2912221
Total Metals by ICP-MS							
Aluminum (Al)-Total	0.0486		0.0050	mg/L	14-AUG-14	14-AUG-14	R2919106
Arsenic (As)-Total	0.00538		0.00020	mg/L	14-AUG-14	14-AUG-14	R2919106
Cadmium (Cd)-Total	0.000077		0.000010	mg/L	14-AUG-14	14-AUG-14	R2919106
Calcium (Ca)-Total	276		0.10	mg/L	14-AUG-14	14-AUG-14	R2919106
Chromium (Cr)-Total	0.0015		0.0010	mg/L	14-AUG-14	14-AUG-14	R2919106
Cobalt (Co)-Total	0.00463		0.00020	mg/L	14-AUG-14	14-AUG-14	R2919106
Copper (Cu)-Total	0.00894		0.00020	mg/L	14-AUG-14	14-AUG-14	R2919106
Iron (Fe)-Total	4.42		0.10	mg/L	14-AUG-14	14-AUG-14	R2919106
Lead (Pb)-Total	0.000755		0.000090	mg/L	14-AUG-14	14-AUG-14	R2919106
Magnesium (Mg)-Total	60.0		0.010	mg/L	14-AUG-14	14-AUG-14	R2919106
Manganese (Mn)-Total	2.04		0.00030	mg/L	14-AUG-14	14-AUG-14	R2919106
Nickel (Ni)-Total	0.0219		0.0020	mg/L	14-AUG-14	14-AUG-14	R2919106
Potassium (K)-Total	57.0		0.020	mg/L	14-AUG-14	14-AUG-14	R2919106
Sodium (Na)-Total	358		0.030	mg/L	14-AUG-14	14-AUG-14	R2919106
Zinc (Zn)-Total	0.0258		0.0020	mg/L	14-AUG-14	14-AUG-14	R2919106
Total Suspended Solids							
Total Suspended Solids	12.0		5.0	mg/L		08-AUG-14	R2913540
pH							
pH	8.10		0.10	pH units		12-AUG-14	R2916228

* 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.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TOT-WP	Water	Alkalinity	APHA 2320B

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

BOD-CBOD-WP	Water	Carbonaceous BOD	APHA 5210 B-5 day Incub.-O2 electrode

A sample of water is incubated for 5 days at 20 degrees Celcius. Comparison of dissolved oxygen content at beginning and end of incubation provides a measure of Biochemical oxygen demand. If carbonaceous BOD is requested, TCMP is added to the sample to chemically inhibit nitrogenous oxygen demand. If soluble BOD is requested, the sample is filtered prior to analysis.

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

The sample is incubated for 5 days at 20 degrees Celcius. Comparison of dissolved oxygen content at the beginning and end of incubation provides a measure of biochemical oxygen demand. If carbonaceous BOD is requested, TCMP is added to the sample to chemically inhibit nitrogenous oxygen demand. If soluble BOD is requested, the sample is filtered prior to analysis. Surface waters have a DL of 1 mg/L. Effluents are diluted according to their history and will have a sample DL of 6 mg/L or greater, depending on the dilutions used.

CL-IC-WP	Water	Chloride by Ion Chromatography	EPA 300.1 (Modified)

Anions in aqueous matrices are analyzed using ion chromatography with conductivity and/or UV absorbance detectors.

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
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-WP	Water	Nitrite as N by Ion Chromatography	EPA 300.1 (Modified)

Anions in aqueous matrices are analyzed using ion chromatography with conductivity and/or UV absorbance detectors.

NO3-IC-WP	Water	Nitrate as N by Ion Chromatography	EPA 300.1 (Modified)

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
Anions in aqueous matrices are analyzed using ion chromatography with conductivity and/or UV absorbance detectors.			
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-WP	Water	Sulfate by Ion Chromatography	EPA 300.1 (Modified)
Anions in aqueous matrices are analyzed using ion chromatography with conductivity and/or UV absorbance detectors.			
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.			
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.			

** 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:

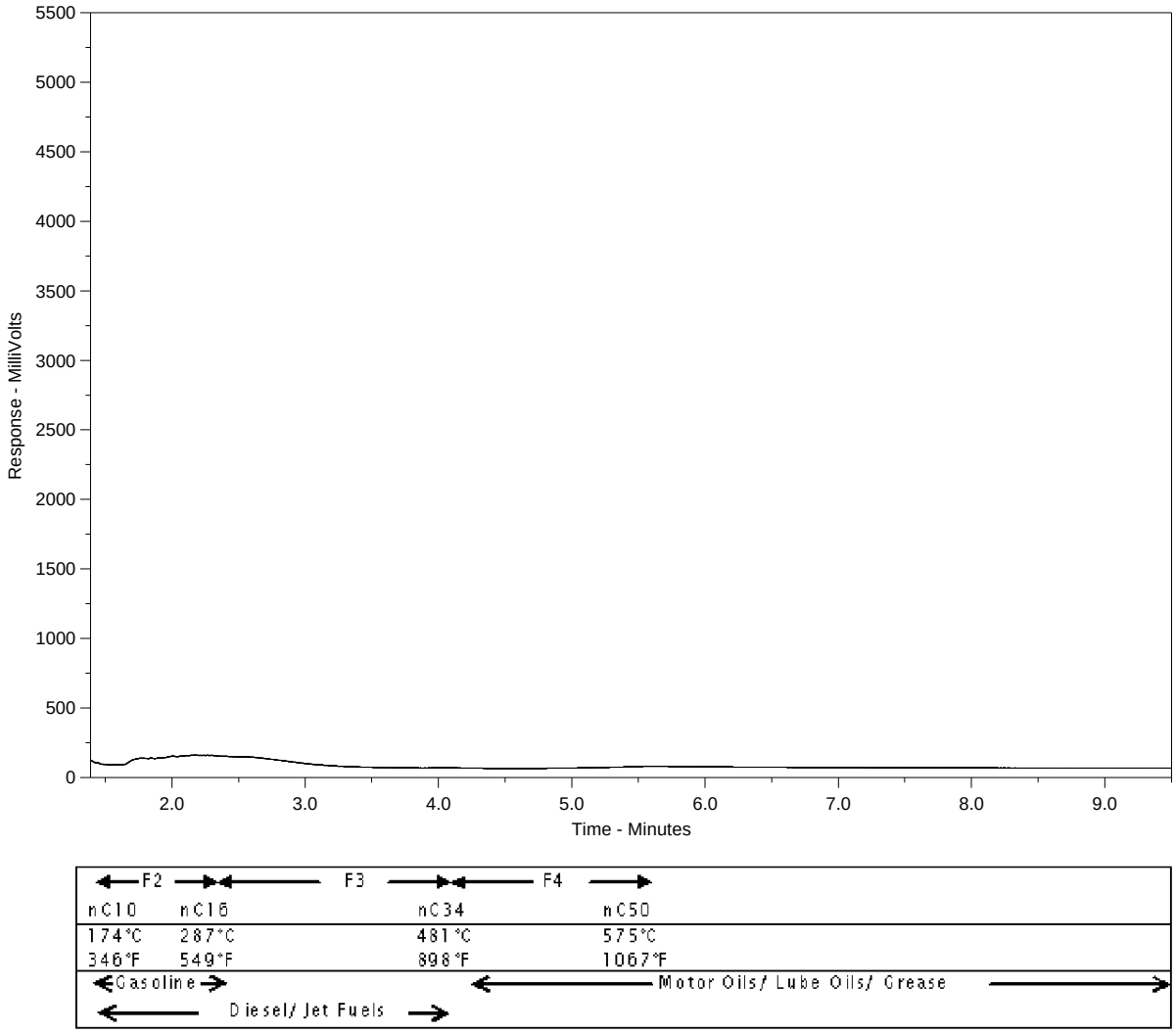
GLOSSARY OF REPORT TERMS

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: L1498490-1
Client Sample ID: RAN-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 Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

L1498490-COFC

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

10-026473

L1498490

Page ___ of ___

Report To	Report Format / Distribution	Service Requested: (Rush subject to availability)
Company: Hamlet of Rankin Inlet	Standard: ✓ Other (specify):	Regular (Standard Turnaround Times))
Contact: Justin Merritt	Select: PDF ✓ Excel Digital Fax	Priority, Date Req'd: _____ (Surcharges apply)
Address: PO Box 310	Email 1: SaoP@RankinInlet.ca	Emergency (1 Business Day) - 100% Surcharge
Rankin Inlet, Nunavut	Email 2: MLusty@gov.nu.ca	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone: 867-645-2895 Fax: 867-645-2146		

Invoice To	Client / Project Information	Analysis Request
Same as Report ? (circle) Yes or No (if No, provide details)	Job #: Rankin Inlet Monitoring Program	(Indicate Filtered or Preserved, F/P)
Copy of Invoice with Report? (circle) Yes or No	PO / AFE:	
Company:	LSD:	
Contact:		
Address:	Quote #:	
Phone: Fax:		

Lab Work Order # (lab use only): [redacted]

ALS Contact: Craig Riddell **Sampler:** Joe Kalodjak

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	BOD	Routine	Nutrients	Phenols	Total Metals	Bacteria	Oil & Grease	PAH: F3-F4	Number of Containers
[redacted]	RAN-2	~~08~~/06/14	09:05		✓	✓	P	P	P	✓	✓	✓	8
[redacted]													
[redacted]													
[redacted]													
[redacted]													
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Special Instructions / Regulations / Hazardous Details

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.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
	Aug 6	9:15	LD	AUG 7/14	9:35	°C				

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