







**Gjoa Haven Water Licence 3BM-GJO1318**

**Annual Report 2013**

**Hamlet of Gjoa Haven, Nunavut**

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## ANNUAL REPORT 2013 – Water Licence: 3BM-GJO1318

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**YEAR BEING REPORTED:** 2013

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water Licence 3BM-GJO 1318 issued to the Gjoa Haven.

- 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 quantities of water used as reported in our On Tap Water Delivery System and the estimated discharge of sewage waste based on quantities used.

<b>Month Reported</b>	<b>Quantity of Water Obtained from all sources (litres)</b>	<b>Quantity of Sewage Waste Discharged</b>
<b>January</b>	3,406,117.70	Same
<b>February</b>	3,088,492.20	Same
<b>March</b>	3,262,795.10	Same
<b>April</b>	3,244,678.00	Same
<b>May</b>	2,989,115.25	Same
<b>June</b>	3,560,136.40	Same
<b>July</b>	3,509,245.80	Same
<b>August</b>	3,781,471.70	Same
<b>September</b>	3,621,442.80	Same
<b>October</b>	3,882,799.61	Same
<b>November</b>	3,636,876.40	Same
<b>December</b>	3,560,874.90	Same
<b>ANNUAL TOTAL</b>	41,544,045.86	Same

## ANNUAL REPORT 2013 – Water Licence: 3BM-GJO1318

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- iv. a summary of modifications and/or major maintenance work carried out on the Water Supply and Waste Disposal Facilities, including all associated structures and facilities;
- 
- A new engineered Sewage Lagoon with full liner on sides and base constructed in a new location short behind the old lagoon and started operation Oct 03, 2013. New outfall to wetland added from the new lagoon for effluent remediation naturally over the wetland before merging into ocean.
  - Old Lagoon remains in place with residual sewage inside after natural outfall through dyke across the berm between two cells.
- v. a list of unauthorized discharges and summary of follow-up action taken;
- 
- Sign of sewage effluent leaks from old lagoon continued until fall 2013 & winter freeze up. It is expected the old lagoon will leak raw effluents again when it thaws until decanting in summer. Scope of current new lagoon project includes the A&R plan for old lagoon and decommissioning process which might include decanting of residual sewage effluent from old lagoon to new lagoon for primary treatment.
  - On March 01, 2013, water supply line showed very low pressure and low flow in the buried line from intake pumphouse to Reheat station #2 (1.3 km). To keep the flow continuity, excess water released from buried line when line in recirculation mode (pump in idle mode) and continuous reheat the water in line from both ends. Once flow rate regained and overcome the situation, water intake resumed without any further interruption. Volume of water released for that couple hours could not be recorded but within the total allowable limit of intake as estimated from flow rate over duration.
  - Uncontrolled leachate from metal waste runs onto wetland and mix with effluent from sewage lagoon near station GJO-4 due to summer snow melts as reported in AANDC inspection. This situation only happened during the early summer and remained dry for the late summer and fall. The Hamlet has reduced the metal heap and closed those openings from metal dump area in fall 2014. Segregation and protection of such free flow of leachate will be continued for summer 2014. Leachate collection sump from solid waste facility identified as GJO-5 (new) at GPS location N 68° 37' 05" and W 95° 50' 44"

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

- There was no abandonment and restoration work carried out in 2013. Plans for decanting the old lagoon in 2014 and remediation old lagoon sludge in 2015.

- 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;
- 

- An Environmental Assessment carried funded by the Hamlet of Gjoa Haven in the fall of 2013 at the solid waste site. The assessment would be used to determine future costs of hazardous waste disposal.
  - A geotechnical inspection carried on Sep 17-18, 2013 in regards to Dam Safety regulation to old lagoon berm as requested by the Board and report was submitted to the Board.
  - A QA/QC plan for sewage and solid waste submitted to the Board.
  - All monitoring stations and facility signage installed as requested by the Board and recorded station location by GPS locator.
  - A&R plan for old sewage lagoon and Spill Contingency Plan submission by July 2014, before six (6) months prior to decommissioning.
- 

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

- A compliance Plan for short term and long term implementation submitted to the Board for water intake, treatment and distribution, sewage disposal and treatment and solid waste disposal, segregation, management and facility securement.
  - An upgrade and major clean-up of the solid waste facility is planned for the near future possibly in 2014-15.
  - Outstanding Annual Reports 2009 through 2010 and O&M manuals of sewage & solid waste facilities submitted as requested in the AANDC inspection 2013.
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- ix. **Updates or revisions to the approved Operation and Maintenance Plans.**
- 

- Updated O&M manual for old sewage facility submitted based on sewage management and wetland remediation. This manual will be superseded with the new O&M manual of new sewage lagoon facility. Draft of new O&M manual under review and expecting submission final version with the Board by June, '14.

- Updated O&M manual and QA/QC plan for solid waste facility submitted to the Board and remains active for follow-up, mostly useful for summer and fall.

**ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:**

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- Natural wetland for sewage and waste effluent remediation working effectively. Environmental monitoring sample results shown contamination parameters within allowable limits.
- No evidence of Bacteria or E. Coli in the source water or supply water as tested by Taiga Lab and Regional Health & Environmental Laboratory in Cambridge Bay.
- There is no mechanical or digital system for water supply measurement, but truck-fill supply from Fluid Manger Data ensures the quantity of distribution.

**FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:**

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- Earlier submitted compliance plan has been updated with the Board for short term and long term implementation for sewage and solid waste site management.
  - Results of monitoring samples are attached with this Annual Report and summarized in the Tabular Form for review and information.
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# Appendix A:

Environmental Sample Results-sewage and solid waste Effluent  
Gjoa Haven Water Licence 3BM-GJO1318

## Part H: Monitoring program.

Item No.1: Four monitoring stations: - (i) GJO-1 (Raw Water at Swan lake)

(ii) GJO-2 (Effluent from Solid waste site (iii) GJO-3: (Raw Sewage at truck offload and (iv) GJO-4: (Effluent Final discharge point)

### item 2: samples at monitoring stations:

Samples collected on July 04, and Aug 06, 2013 and tested results

#### Wastewater/Sewage parameters

Parameter	MAC	units	Sample July 04,2013		Sample Aug 06,2013			
	Limits (Water)		GJO-2	GJO-4	GJO-2	GJO-4	GJO-2	GJO-4
Alkalinity		mg/L	349	284	430	322		
Conductivity		µS/cm	2630	1040	2830	1130		
p <sup>H</sup>	6-9		6.86	7.98	7.43	7.74		
TSS	1000	mg/L	84	38	130	16		
Ammonia N2	80	mg/L	12	24.1	18.1	21.2		
BOD	80	mg/L	>238.8	31	41.88	7		
Organic Carbon		mg/L	292	61	142	38.7		
Nitrate as N2	45	mg/L	<0.01	2.28	0.35	1.76		
Nitrite as N2	3.2	Mg/L	<0.01	0.23	<0.01	0.32		
Calcium		mg/L	361	33.3	381	49.5		
Chloride	250	mg/L	178	144	198	156		
Hardness	500	mg/L	1140	186	1140	254		
Magnesium		mg/L	58.1	25	71	31.8		
Potassium		mg/L	53	21.5	60.3	21.2		
Sodium	200	mg/L	164	109	202	128		
Sulphate	500	mg/L	908	17	1030	10		
Fecal Coliform	10000	CFU/100mL	13300	1600	40	125		
Oil and Gas	5000	µg/L	Non-vis	Non-vis	non-vis	non-vis		
Aluminium	200	µg/L	182	46.9	111	22		
Arsenic	100	µg/L	10.6	9.9	9	9.3		
Cadmium	5	µg/L	0.57	0.06	1.31	0.32		
Chromium	100	µg/L	6.5	0.5	4.4	0.9		
Cobalt	50	µg/L	8.9	2.4	3.4	2.2		
Copper	200	µg/L	82.4	8.9	130	4.3		
Iron	300	µg/L	19600	1760	20500	1970		
Lead	50	µg/L	23.8	3.1	37.5	1.0		
Manganese	50	µg/L	892	127	897	121		
Nickel	200	µg/L	30.9	5.9	22.3	7.8		
Zinc	500	µg/L	1120	7.7	1270	7.1		
Mercury	0.6	µg/L	0.16	0.03	0.14	0.02		
PCB	1000	µg/L						
Phenols	20	µg/L						

## Gjoa Haven Water Licence-NWB3GJO-0409

### Monitoring Stations of sewage and solid waste sample collection

Sampling Station	GPS Location		Description	comments
	Latitude	Longitude		
<b>GJO-1</b>	N 68 <sup>0</sup> 39' 22.9 "	W 95 <sup>0</sup> 55' 06.5 "	Raw Water supply at Swan Lake	Volume of water collected from lake
<b>GJO-2</b>	N 68 <sup>0</sup> 37' 05 "	W 95 <sup>0</sup> 50' 42 "	Effluent Final discharge point from Solid Waste	Outside the berm, on meandering wetland
<b>GJO-3</b>	N 68 <sup>0</sup> 37' 28.8 "	W 95 <sup>0</sup> 50' 21.9 "	Raw Sewage at Truck offload point	Detention cell sewage lagoon
<b>GJO-4</b>	N 68 <sup>0</sup> 37' 23 "	W 95 <sup>0</sup> 50' 39 "	Effluent Final discharge point of sewage facility	Natural flow On wetland shallow channel
<b>GJO-5</b>	N 68 <sup>0</sup> 37' 05 "	W 95 <sup>0</sup> 50' 44 "	Solid Waste Leachate retention inside berm	<b>New station.</b> Sample collect only when decanting requires



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scale	CLIENT:	project no.
NTS	GJOA HAVEN, NUNAVUT	OTT-00209248-A0
date	TITLE:	FIG 02
30/08/2013	MONITORING STATION LOCATIONS	
drawn by		
E.A.		

# Appendix B:

Environmental Sample Results-sewage and solid waste Effluent  
Gjoa Haven Water Licence 3BM-GJO1318



**Taiga Environmental Laboratory**  
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3  
Tel: (867)-669-2788 Fax: (867)-669-2718

**Taiga Batch No.:**  
**130473**

## **- FINAL REPORT -**

**Prepared For:** Hamlet of Gjoa Haven

**Address:** P.O. Box 200  
Gjoa Haven, NU  
X0B 1J0

**Attn:** Jacob Keanik

**Facsimile:** (867) 360-6309

**Final report has been reviewed and approved by:**

**Angelique Ruzindana**  
**Quality Assurance Officer**

### **NOTES:**

- Test methods and data are validated by the laboratory's Quality Assurance Program. Taiga Environmental Laboratory is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) as a testing laboratory for specific tests registered with CALA.
- Routine methods are based on recognized procedures from sources such as
  - Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
  - Environment Canada
  - USEPA
- Samples shall be kept for thirty (30) days after the final report is issued. All microbiological samples shall be disposed of immediately upon completion of analysis to minimize biohazardous risks to laboratory personnel. Please contact the laboratory if you have any special requirements.
- Final results are based on the specific tests at the time of analysis and do not represent the conditions during sampling.

**ReportDate:** Wednesday, July 17, 2013

**Print Date:** Wednesday, July 17, 2013



**Taiga Environmental Laboratory**  
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3  
Tel: (867)-669-2788 Fax: (867)-669-2718

**Taiga Batch No.:**  
**130473**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID:** GJO-2

**Taiga Sample ID:** 001

**Client Project:** GJO 0713

**Sample Type:** Wastewater

**Received Date:** 05-Jul-13

**Sampling Date:** 04-Jul-13

**Sampling Time:** 10:30

**Location:** Gjoa Haven

**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b><u>Inorganics - Physicals</u></b>						
Alkalinity, Total (as CaCO <sub>3</sub> )	349	0.4	mg/L	06-Jul-13	SM2320:B	
Conductivity, Specific (@ 25°C)	2630	0.4	µS/cm	06-Jul-13	SM2510:B	
pH	6.86		pH units	06-Jul-13	SM4500-H:B	
Solids, Total Suspended	84	3	mg/L	07-Jul-13	SM2540:D	
<b><u>Inorganics - Nutrients</u></b>						
Ammonia as Nitrogen	12.0	0.005	mg/L	11-Jul-13	SM4500-NH <sub>3</sub> :	
Biochemical Oxygen Demand	>238.8	2	mg/L	05-Jul-13	SM5210:B	62
Organic Carbon, Total	292	0.5	mg/L	09-Jul-13	SM5310:B	
<b><u>Major Ions</u></b>						
Calcium	361	0.1	mg/L	05-Jul-13	SM4110:B	
Chloride	178	0.7	mg/L	05-Jul-13	SM4110:B	
Hardness	1140	0.7	mg/L	05-Jul-13	SM2340:B	
Magnesium	58.1	0.1	mg/L	05-Jul-13	SM4110:B	
Nitrate as Nitrogen	< 0.01	0.01	mg/L	05-Jul-13	SM4110:B	

**ReportDate:** Wednesday, July 17, 2013

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**Print Date:** Wednesday, July 17, 2013



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Tel: (867)-669-2788 Fax: (867)-669-2718

**Taiga Batch No.:**  
**130473**

**- CERTIFICATE OF ANALYSIS -**

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**Client Sample ID: GJO-2**

**Taiga Sample ID: 001**

Nitrite as Nitrogen	< 0.01	0.01	mg/L	05-Jul-13	SM4110:B
Potassium	53.0	0.1	mg/L	05-Jul-13	SM4110:B
Sodium	164	0.1	mg/L	05-Jul-13	SM4110:B
Sulphate	908	1	mg/L	05-Jul-13	SM4110:B

**Microbiology**

Coliforms, Fecal (other)	13300	100	CFU/100mL	05-Jul-13	SM9222:D
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**Organics**

Oil and Grease, visible	Non-visible			10-Jul-13	Visual Exam
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**Trace Metals, Total**

Aluminum	182	0.6	µg/L	16-Jul-13	EPA200.8
Arsenic	10.6	0.2	µg/L	16-Jul-13	EPA200.8
Cadmium	0.57	0.05	µg/L	16-Jul-13	EPA200.8
Chromium	6.5	0.1	µg/L	16-Jul-13	EPA200.8
Cobalt	8.9	0.1	µg/L	16-Jul-13	EPA200.8
Copper	82.4	0.2	µg/L	16-Jul-13	EPA200.8
Iron	19600	5	µg/L	16-Jul-13	EPA200.8
Lead	23.8	0.1	µg/L	16-Jul-13	EPA200.8
Manganese	892	0.1	µg/L	16-Jul-13	EPA200.8
Mercury	0.16	0.01	µg/L	16-Jul-13	EPA200.8
Nickel	30.9	0.1	µg/L	16-Jul-13	EPA200.8
Zinc	1120	0.4	µg/L	16-Jul-13	EPA200.8

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**ReportDate:** Wednesday, July 17, 2013

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**Print Date:** Wednesday, July 17, 2013





Taiga Environmental Laboratory  
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3  
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.:  
**130473**

**- CERTIFICATE OF ANALYSIS -**

Client Sample ID: **GJO-4**

Taiga Sample ID: **002**

Client Project: GJO 0713

Sample Type: Sewage

Received Date: 05-Jul-13

Sampling Date: 04-Jul-13

Sampling Time: 10:30

Location: Gjoa Haven

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Inorganics - Physicals</u></b>						
Alkalinity, Total (as CaCO <sub>3</sub> )	284	0.4	mg/L	06-Jul-13	SM2320:B	
Conductivity, Specific (@ 25°C)	1040	0.4	µS/cm	06-Jul-13	SM2510:B	
pH	7.98		pH units	06-Jul-13	SM4500-H:B	
Solids, Total Suspended	38	3	mg/L	07-Jul-13	SM2540:D	
<b><u>Inorganics - Nutrients</u></b>						
Ammonia as Nitrogen	24.1	0.005	mg/L	11-Jul-13	SM4500-NH <sub>3</sub> :	
Biochemical Oxygen Demand	31	2	mg/L	05-Jul-13	SM5210:B	
Organic Carbon, Total	61.0	0.5	mg/L	09-Jul-13	SM5310:B	
<b><u>Major Ions</u></b>						
Calcium	33.3	0.1	mg/L	05-Jul-13	SM4110:B	
Chloride	144	0.7	mg/L	05-Jul-13	SM4110:B	
Hardness	186	0.7	mg/L	06-Jul-13	SM2340:B	
Magnesium	25.0	0.1	mg/L	05-Jul-13	SM4110:B	
Nitrate as Nitrogen	2.28	0.01	mg/L	05-Jul-13	SM4110:B	
Nitrite as Nitrogen	0.23	0.01	mg/L	05-Jul-13	SM4110:B	

ReportDate: Wednesday, July 17, 2013

Print Date: Wednesday, July 17, 2013



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Tel: (867)-669-2788 Fax: (867)-669-2718

**Taiga Batch No.:**  
**130473**

**- CERTIFICATE OF ANALYSIS -**

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**Client Sample ID:** GJO-4

**Taiga Sample ID:** 002

Potassium	21.5	0.1	mg/L	05-Jul-13	SM4110:B
Sodium	109	0.1	mg/L	05-Jul-13	SM4110:B
Sulphate	17	1	mg/L	05-Jul-13	SM4110:B

**Microbiology**

Coliforms, Fecal (other)	1600	100	CFU/100mL	05-Jul-13	SM9222:D
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**Organics**

Oil and Grease, visible	Non-visible			10-Jul-13	Visual Exam
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**Trace Metals, Total**

Aluminum	46.9	0.6	µg/L	16-Jul-13	EPA200.8
Arsenic	9.9	0.2	µg/L	16-Jul-13	EPA200.8
Cadmium	0.06	0.05	µg/L	16-Jul-13	EPA200.8
Chromium	0.5	0.1	µg/L	16-Jul-13	EPA200.8
Cobalt	2.4	0.1	µg/L	16-Jul-13	EPA200.8
Copper	8.9	0.2	µg/L	16-Jul-13	EPA200.8
Iron	1760	5	µg/L	16-Jul-13	EPA200.8
Lead	3.1	0.1	µg/L	16-Jul-13	EPA200.8
Manganese	127	0.1	µg/L	16-Jul-13	EPA200.8
Mercury	0.03	0.01	µg/L	16-Jul-13	EPA200.8
Nickel	5.9	0.1	µg/L	16-Jul-13	EPA200.8
Zinc	7.7	0.4	µg/L	16-Jul-13	EPA200.8

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**Print Date:** Wednesday, July 17, 2013



## Taiga Environmental Laboratory

4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3

Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.:

**130473**

### - CERTIFICATE OF ANALYSIS -

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Client Sample ID: **GJO-4**

Taiga Sample ID: **002**

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### - DATA QUALIFIERS -

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#### Data Qualifier Descriptions:

**62**      *Residual DO was less than 1 mg/L. Unable to repeat analysis at lower dilution. Holding time exceeded.*

**\* Taiga analytical methods are based on the following standard analytical methods**

SM - Standard Methods for the Examination of Water and Wastewater

EPA - United States Environmental Protection Agency

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**Taiga Environmental Laboratory**  
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Tel: (867)-669-2788 Fax: (867)-669-2718

**Taiga Batch No.:**  
**130622**

## **- FINAL REPORT -**

**Prepared For:** Hamlet of Gjoa Haven

**Address:** P.O. Box 200  
Gjoa Haven, NU  
X0B 1J0

**Attn:** Jacob Keanik

**Facsimile:** (867) 360-6309

**Final report has been reviewed and approved by:**

**Angelique Ruzindana**  
**Quality Assurance Officer**

### **NOTES:**

- Test methods and data are validated by the laboratory's Quality Assurance Program. Taiga Environmental Laboratory is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) as a testing laboratory for specific tests registered with CALA.
- Routine methods are based on recognized procedures from sources such as
  - Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
  - Environment Canada
  - USEPA
- Samples shall be kept for thirty (30) days after the final report is issued. All microbiological samples shall be disposed of immediately upon completion of analysis to minimize biohazardous risks to laboratory personnel. Please contact the laboratory if you have any special requirements.
- Final results are based on the specific tests at the time of analysis and do not represent the conditions during sampling.

**ReportDate:** Friday, August 16, 2013

**Print Date:** Friday, August 16, 2013



**Taiga Environmental Laboratory**  
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3  
Tel: (867)-669-2788 Fax: (867)-669-2718

**Taiga Batch No.:**  
**130622**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID:** GJOA-02

**Taiga Sample ID:** 001

**Client Project:** GJOA-02,GJOA-04

**Sample Type:** Water

**Received Date:** 07-Aug-13

**Sampling Date:** 06-Aug-13

**Sampling Time:** 10:30

**Location:** Gjoa Haven, NU

**Report Status:** Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<b><u>Inorganics - Physicals</u></b>						
Alkalinity, Total (as CaCO <sub>3</sub> )	430	0.4	mg/L	07-Aug-13	SM2320:B	
Conductivity, Specific (@ 25°C)	2830	0.4	µS/cm	07-Aug-13	SM2510:B	
pH	7.43		pH units	07-Aug-13	SM4500-H:B	
Solids, Total Suspended	130	3	mg/L	08-Aug-13	SM2540:D	
<b><u>Inorganics - Nutrients</u></b>						
Ammonia as Nitrogen	18.1	0.005	mg/L	14-Aug-13	SM4500-NH <sub>3</sub> :	
Biochemical Oxygen Demand	>41.88	2	mg/L	07-Aug-13	SM5210:B	62
Organic Carbon, Total	142	0.5	mg/L	08-Aug-13	SM5310:B	
<b><u>Major Ions</u></b>						
Calcium	381	0.1	mg/L	07-Aug-13	SM4110:B	
Chloride	198	0.7	mg/L	07-Aug-13	SM4110:B	
Hardness	1240	0.7	mg/L	07-Aug-13	SM2340:B	
Magnesium	71.0	0.1	mg/L	07-Aug-13	SM4110:B	
Nitrate as Nitrogen	0.35	0.01	mg/L	07-Aug-13	SM4110:B	

**ReportDate:** Friday, August 16, 2013

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**Print Date:** Friday, August 16, 2013



**Taiga Environmental Laboratory**  
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3  
Tel: (867)-669-2788 Fax: (867)-669-2718

**Taiga Batch No.:**  
**130622**

**- CERTIFICATE OF ANALYSIS -**

**Client Sample ID: GJOA-02**

**Taiga Sample ID: 001**

Nitrite as Nitrogen	< 0.01	0.01	mg/L	07-Aug-13	SM4110:B
Potassium	60.3	0.1	mg/L	07-Aug-13	SM4110:B
Sodium	202	0.1	mg/L	07-Aug-13	SM4110:B
Sulphate	1030	1	mg/L	07-Aug-13	SM4110:B

**Microbiology**

Coliforms, Fecal (other)	40	10	CFU/100mL	07-Aug-13	SM9222:D
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**Organics**

Oil and Grease, visible	Non-visible			14-Aug-13	Visual Exam
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**Trace Metals, Total**

Aluminum	111	0.6	µg/L	11-Aug-13	EPA200.8
Arsenic	9.0	0.2	µg/L	11-Aug-13	EPA200.8
Cadmium	1.31	0.05	µg/L	11-Aug-13	EPA200.8
Chromium	4.4	0.1	µg/L	11-Aug-13	EPA200.8
Cobalt	3.4	0.1	µg/L	11-Aug-13	EPA200.8
Copper	130	0.2	µg/L	11-Aug-13	EPA200.8
Iron	20500	5	µg/L	11-Aug-13	EPA200.8
Lead	37.5	0.1	µg/L	11-Aug-13	EPA200.8
Manganese	897	0.1	µg/L	11-Aug-13	EPA200.8
Mercury	0.14	0.01	µg/L	11-Aug-13	EPA200.8
Nickel	22.3	0.1	µg/L	11-Aug-13	EPA200.8
Zinc	1270	0.4	µg/L	11-Aug-13	EPA200.8

**ReportDate:** Friday, August 16, 2013

Page 3 of 6

**Print Date:** Friday, August 16, 2013



Taiga Environmental Laboratory  
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3  
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.:  
**130622**

## - CERTIFICATE OF ANALYSIS -

Client Sample ID: **GJOA-04**

Taiga Sample ID: **002**

Client Project: GJOA-02,GJOA-04

Sample Type: Water

Received Date: 07-Aug-13

Sampling Date: 06-Aug-13

Sampling Time: 10:30

Location: Gjoa Haven, NU

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<b><u>Inorganics - Physicals</u></b>						
Alkalinity, Total (as CaCO <sub>3</sub> )	322	0.4	mg/L	07-Aug-13	SM2320:B	
Conductivity, Specific (@ 25°C)	1130	0.4	µS/cm	07-Aug-13	SM2510:B	
pH	7.74		pH units	07-Aug-13	SM4500-H:B	
Solids, Total Suspended	16	3	mg/L	08-Aug-13	SM2540:D	
<b><u>Inorganics - Nutrients</u></b>						
Ammonia as Nitrogen	21.2	0.005	mg/L	14-Aug-13	SM4500-NH <sub>3</sub> :	
Biochemical Oxygen Demand	7	2	mg/L	07-Aug-13	SM5210:B	
Organic Carbon, Total	38.7	0.5	mg/L	08-Aug-13	SM5310:B	
<b><u>Major Ions</u></b>						
Calcium	49.5	0.1	mg/L	07-Aug-13	SM4110:B	
Chloride	156	0.7	mg/L	07-Aug-13	SM4110:B	
Hardness	254	0.7	mg/L	07-Aug-13	SM2340:B	
Magnesium	31.8	0.1	mg/L	07-Aug-13	SM4110:B	
Nitrate as Nitrogen	1.76	0.01	mg/L	07-Aug-13	SM4110:B	
Nitrite as Nitrogen	0.32	0.01	mg/L	07-Aug-13	SM4110:B	

ReportDate: Friday, August 16, 2013

Print Date: Friday, August 16, 2013





Taiga Environmental Laboratory  
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3  
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.:  
**130622**

## - CERTIFICATE OF ANALYSIS -

Client Sample ID: **GJOA-04**

Taiga Sample ID: **002**

Potassium	21.2	0.1	mg/L	07-Aug-13	SM4110:B
Sodium	128	0.1	mg/L	07-Aug-13	SM4110:B
Sulphate	10	1	mg/L	07-Aug-13	SM4110:B

### Microbiology

Coliforms, Fecal (other)	16	1	CFU/100mL	07-Aug-13	SM9222:D
--------------------------	----	---	-----------	-----------	----------

### Organics

Oil and Grease, visible	Non-visible	14-Aug-13	Visual Exam
-------------------------	-------------	-----------	-------------

### Trace Metals, Total

Aluminum	22.0	0.6	µg/L	11-Aug-13	EPA200.8
Arsenic	9.3	0.2	µg/L	11-Aug-13	EPA200.8
Cadmium	0.32	0.05	µg/L	11-Aug-13	EPA200.8
Chromium	0.9	0.1	µg/L	11-Aug-13	EPA200.8
Cobalt	2.2	0.1	µg/L	11-Aug-13	EPA200.8
Copper	4.3	0.2	µg/L	11-Aug-13	EPA200.8
Iron	1970	5	µg/L	11-Aug-13	EPA200.8
Lead	1.0	0.1	µg/L	11-Aug-13	EPA200.8
Manganese	121	0.1	µg/L	11-Aug-13	EPA200.8
Mercury	0.02	0.01	µg/L	11-Aug-13	EPA200.8
Nickel	7.8	0.1	µg/L	11-Aug-13	EPA200.8
Zinc	7.1	0.4	µg/L	11-Aug-13	EPA200.8

**ReportDate:** Friday, August 16, 2013

Page 5 of 6

**Print Date:** Friday, August 16, 2013



Taiga Environmental Laboratory  
4601-52nd Ave., Box 1500, Yellowknife, NT. X1A 2R3  
Tel: (867)-669-2788 Fax: (867)-669-2718

Taiga Batch No.:  
**130622**

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- CERTIFICATE OF ANALYSIS -

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Client Sample ID: **GJOA-04**

Taiga Sample ID: **002**

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- DATA QUALIFIERS -

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*Data Qualifier Descriptions:*

**62**      *Residual DO was less than 1 mg/L. Unable to repeat analysis at lower dilution. Holding time exceeded.*

**\* Taiga analytical methods are based on the following standard analytical methods**

SM - Standard Methods for the Examination of Water and Wastewater

EPA - United States Environmental Protection Agency

**ReportDate:** Friday, August 16, 2013

**Print Date:** Friday, August 16, 2013

# Appendix C:

Water Sample Results-Bacterial and E. Coli  
Gjoa Haven Water Licence 3BM-GJO1318



**LABORATORY REPORT**  
**Stanton Territorial Hospital Laboratory**  
550 Byrne Road, P.O. Box 10  
Yellowknife, NT X1A 2N1  
Phone: 867-669-4163 Fax: 867-669-4141

Lab No: 25080422

Patient: **GJOA HAVEN, HAMLET OF**  
DOB: Age: 51 Sex: N  
HCN: Client ID: HX00000032  
Stanton Chart No:  
Pl. Phone: 8676694162  
Location: EHO - KITIKMEOT  
Room: Adm. Date: 05/12/11

Encounter: WX0000000032  
Attending Pract.: PHYSICIAN, NOT  
Requested by: PHYSICIAN, NOT  
Send to: KITIKMEOT REGIONAL ENGINEER  
Copy to: EHO - KITIKMEOT, EHK  
KITIKMEOT REGIONAL  
KITIKMEOT MUNICIPAL

Test: Water

**MICROBIOLOGY**

Requestion: 08/01/13 15:27

Status:

KITIKMEOT REGIONAL ENGINEER, KRI - Cambridge Bay NU,

Source: Lake Water Water Truck 7449

Collected: 07/01/13 00:01

Order#: 25080422

Received: 08/01/13 15:27

Public, chlorinated water supply

**TOTAL COLIFORM & E.COLI TESTING (P/A \* FINAL**

09/01/13 13:17

**COLILERT METHOD)**

09/01/13 **TOTAL COLIFORM: absent**  
**E.COLI: absent**

Micro Key for Results: \* - New Results \*\* - Result was modified after Final status set

SCC

STATUS  
Page 1 of 1

Printed: 01/09/13 13:39



**LABORATORY REPORT**  
**Stanton Territorial Hospital Laboratory**  
550 Byrnie Road, P.O. Box 10  
Yellowknife, NT X1A 2N1  
Phone: 867-669-4163 Fax: 867-669-4141

Lab No: 25080423

Patient: **GJOA HAVEN, HAMLET OF**  
DOB: Age: 51 Sex: M  
HCN: Client ID: HLX00000032  
Stanton Chart No:  
Pt. Phone: 8676694162  
Location: EHO - KITIKMEOT  
Room: Adm. Date: 05/12/11

Encounter: WX0000000032  
Attending Pract.: PHYSICIAN, NOT  
Requested by: PHYSICIAN, NOT  
Send to: KITIKMEOT REGIONAL ENGINEER  
Copy to: EHO - KITIKMEOT, BHK  
KITIKMEOT REGIONAL  
KITIKMEOT MUNICIPAL

Test: Water

**MICROBIOLOGY**

Requested on: 08/01/13 13:17

Slides

KITIKMEOT REGIONAL ENGINEER, KRF - Cambridge Bay NU.

Source: Lake Water Water Truck 7660  
Order#: 25080423

Collected: 07/01/13 00:01  
Received: 08/01/13 15:28

Public, chlorinated water supply

**TOTAL COLIFORM & E.COLI TESTING (P/A \* FINAL 09/01/13 13:17**  
**COLILERT METHOD)**

09/01/13 **TOTAL COLIFORM: absent**  
**E.COLI: absent**

Micro Key for Results: \* - New Results \*\* - Result was modified after Final status set

SCC

STATUS  
Page 1 of 1

Form: MM6146  
Printed: 01/09/13 13:39



**LABORATORY REPORT**  
**Stanton Territorial Hospital Laboratory**  
550 Byrnie Road, P.O. Box 10  
Yellowknife, NT X1A 2N1  
Phone: 867-669-4163 Fax: 867-669-4141

Lab No: 25080424

Patient: **GJOA HAVEN, HAMLET OF**  
DOB: Age: 51 Sex: N  
HCN: Client ID: HX00000032  
Stanton Chart No:  
Pt. Phone: 8676694162  
Location: EHO - KITIKMEOT  
Room: Adm. Date: 05/12/11

Encounter: WX0000000032  
Attending Pract.: PHYSICIAN, NOT  
Requested by: PHYSICIAN, NOT  
Send to: KITIKMEOT REGIONAL ENGINEER  
Copy to: EHO - KITIKMEOT, EHK  
KITIKMEOT REGIONAL  
KITIKMEOT MUNICIPAL

Test: Water

**MICROBIOLOGY**

Requested On: 08/01/13 15:28

Status

KITIKMEOT REGIONAL ENGINEER, KRP - Cambridge Bay NU.

Source: Lake Water Water Truck 7448  
Order#: 25080424

Collected: 07/01/13 00:01  
Received: 08/01/13 15:30

Public, chlorinated water supply

**TOTAL COLIFORM & E.COLI TESTING (P/A \* FINAL**  
**COLILERT METHOD)**

09/01/13 13:17

09/01/13 **TOTAL COLIFORM: absent**  
**E.COLI: absent**

Micro Key for Results: \* - New Results \*\* - Result was modified after Final status set

SCC

STATUS  
Page 1 of 1

Page: 01/09/13  
Printed: 01/09/13 13:39



**LABORATORY REPORT**  
**Stanton Territorial Hospital Laboratory**  
 550 Byrne Road, P.O. Box 10  
 Yellowknife, NT X1A 2N1  
 Phone: 867-669-4163 Fax: 867-669-4141

Lab No. 27070140

Patient: **GJOA HAVEN, HAMLET OF**  
 DOB: Age: **51** Sex: **N**  
 HCN: Client ID: **HX00000032**  
 Stanton Chart No:  
 Pl. Phone: 8676694162  
 Location: **EHO - KITIKMEOT**  
 Room: Adm. Date: **05/12/11**

Encounter: **WX000000032**  
 Attending Pract.: **PHYSICIAN, NOT**  
 Requested by: **PHYSICIAN, NOT**  
 Send to: **KITIKMEOT REGIONAL ENGINEER**  
 Copy to: **EHO - KITIKMEOT, EHK**  
**KITIKMEOT REGIONAL**  
**KITIKMEOT MUNICIPAL**

Test, Water

**MICROBIOLOGY**

Requested on: 07/03/13 11:01

KITIKMEOT REGIONAL ENGINEER, KRE Cambridge Bay NU,

Switcher

Source: **Lake Water Water Truck H7660**Collected: **06/03/13 15:00**Order#: **27070140**Received: **07/03/13 11:02**

Public, chlorinated water supply

**TOTAL COLIFORM & E.COLI TESTING (P/A**  
**COLLERT METHOD)**

**\* FINAL****08/03/13 15:47**

08/03/13 **TOTAL COLIFORM: absent**  
**E.COLI: absent**

Micro Key for Results: \* - New Results \*\* - Result was modified after Final status set

SCC

STATUS  
 Page 1 of 1

Printed: 03/08/13 16:09  
 From: 03/08/13



**LABORATORY REPORT**  
**Stanton Territorial Hospital Laboratory**  
 550 Byrne Road, P.O. Box 10  
 Yellowknife, NT X1A 2N1  
 Phone: 867-669-4163 Fax: 867-669-4141

Lab No: 27070143

Patient: **CJOA HAVEN, HAMLET OF**  
 DOB: Age: 51 Sex: N  
 LICN: Client ID: EX000000032  
 Stanton Chart No:  
 Pt. Phone: 8676694162  
 Location: EHO - KITIKMEOT  
 Room: Adm. Date: 05/12/11

Encounter: WX0000000032  
 Attending Pract.: PHYSICIAN, NOT  
 Requested by: PHYSICIAN, NOT  
 Send to: KITIKMEOT REGIONAL ENGINEER  
 Copy to: EHO - KITIKMEOT, EHK  
 KITIKMEOT REGIONAL  
 KITIKMEOT MUNICIPAL

Test, Water

**MICROBIOLOGY**

Requested on: 07/03/13 11:02

Status

KITIKMEOT REGIONAL ENGINEER, KRP Cambridge Bay NU,

Switcher

Source: Lake Water Water Truck H7449  
 Order#: 27070143

Collected: 06/03/13 15:00  
 Received: 07/03/13 11:02

Public, chlorinated water supply

**TOTAL COLIFORM & E.COLI TESTING (P/A \* FINAL**  
**COLILERT METHOD)**

08/03/13 15:47

08/03/13 **TOTAL COLIFORM: absent**  
**E.COLI: absent**

Micro Key for Results: \* - New Results \*\* - Result was modified after Final status set

SCC

STATUS  
 Page 1 of 1

Printed: 03/08/13 16:09  
 From: FINISH





# LABORATORY REPORT

## Stanton Territorial Hospital Laboratory

Lab No: 27070144

550 Byrne Road, P.O. Box 10  
Yellowknife, NT X1A 2N1  
Phone: 867-669-4163 Fax: 867-669-4141

Patient: **GJOA HAVEN, HAMLET OF**  
DOB: Age: 51 Sex: M  
HCN: Client ID: HX00000032  
Stanton Chart No:  
Pt. Phone: 8676694162  
Location: EHO - KITIKMEOT  
Room: Adm. Date: 05/12/11

Encounter: WX0000000032  
Attending Pract.: PHYSICIAN, NOT  
Requested by: PHYSICIAN, NOT  
Send to: KITIKMEOT REGIONAL ENGINEER  
Copy to: EHO - KITIKMEOT, EHK  
KITIKMEOT REGIONAL  
KITIKMEOT MUNICIPAL

Test, Water

### MICROBIOLOGY

Requested on: 07/03/13 11:02

KITIKMEOT REGIONAL ENGINEER, KRF - Cambridge Bay NL

Switcher

Source: Lake Water Water Truck H7448  
Order#: 27070144

Collected: 06/03/13 15:00  
Received: 07/03/13 11:02

Public, chlorinated water supply

TOTAL COLIFORM & E.COLI TESTING (P/A \* FINAL  
COLILERT METHOD)

08/03/13 15:47

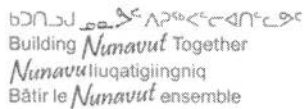
08/03/13 **TOTAL COLIFORM: absent**  
**E.COLI: absent**

Micro Key for Results: \* - New Results \*\* - Result was modified after Final status set

SCC

STATUS  
Page 1 of 1

Printed: 03/08/13 16:09  
MAR-11-2013 16:20 From: STANTON HOSPITAL LAB 8676694141



Ministère de la Santé

**Reporting Date: April 27, 2013**

Reference Number 415-04-01

Date & Time Received: April 26, 2013; 9:45 AM

2. E. Coli: absent

Satisfactory

Wilfred Ntiamoah, MPH, CPHI(C)  
Regional Environmental Health Officer  
Kitikmeot Region - Dept. of Health & Social Services  
Helen Maksagak Centre, P.O. Box 83  
Cambridge Bay, NUNAVUT, X0B 0C0  
Phone: (867) 983-4236  
Email : [wntiamoah@gov.nu.ca](mailto:wntiamoah@gov.nu.ca)



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Building *Nunavut* Together  
*Nunavut* liuqatigiingniq  
Bâtir le *Nunavut* ensemble

Department of Health  
Munaqhiliqiyitkut  
Ministère de la Santé

## LABORATORY REPORT

*Cambridge Bay Water Laboratory*

*Reporting Date: April 27, 2013*

*Reference Number 415-04-01*

Source of water: Water Truck # 7449 - Hamlet of Gjoa Haven

Date & Time collected: April 25, 2013; 11:35 AM

Date & Time Received: April 26, 2013; 11:39 PM

TOTAL COLIFORM AND E. COLI TESTING (Present / Absent; Coli-ert method).

1. TOTAL COLIFORM: **absent**
2. E. Coli: **absent**

REMARK:

Satisfactory

Wilfred Ntiamoah, MPH, CPHI(C)  
Regional Environmental Health Officer  
Kitikmeot Region - Dept. of Health & Social Services  
Helen Maksagak Centre, P.O. Box 83  
Cambridge Bay, NUNAVUT, X0B 0C0  
Phone: (867) 983-4236  
Email : [wntiamoah@gov.nu.ca](mailto:wntiamoah@gov.nu.ca)



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Building *Nunavut* Together  
*Nunavut* iluqatigiingniq  
Bâtir le *Nunavut* ensemble

Department of Health  
Munaqhiliqiyitkut  
Ministère de la Santé

## LABORATORY REPORT

*Cambridge Bay Water Laboratory*

*Reporting Date: April 27, 2013*

*Reference Number 415-04-01*

Source of water: Water Truck # 7448 - Hamlet of Gjoa Haven

Date & Time collected: April 25, 2013; 11:38 AM

Date & Time Received: April 26, 2013; 09:45 AM

TOTAL COLIFORM AND E. COLI TESTING (Present / Absent; Coliert method).

1. TOTAL COLIFORM: **absent**
2. E. Coli: **absent**

REMARK:

Satisfactory

Wilfred Ntiamoah, MPH, CPHI(C)  
Regional Environmental Health Officer  
Kitikmeot Region - Dept. of Health & Social Services  
Helen Maksagak Centre, P.O. Box 83  
Cambridge Bay, NUNAVUT, X0B 0C0  
Phone: (867) 983-4236  
Email : [wntiamoah@gov.nu.ca](mailto:wntiamoah@gov.nu.ca).

# LABORATORY REPORT

**Cambridge Bay Water Laboratory**

**Reporting Date: June 07, 2013**

Reference Number 415-06-01

Source of water: Water Truck # 7660 - Hamlet of Gjoa Haven

Date & Time collected: June 05, 2013; 3:35 PM

Date & Time Received: June 06, 2013; 9:30 AM

TOTAL COLIFORM AND E. COLI TESTING (Present / Absent; Coli-ert method).

1. TOTAL COLIFORM: **absent**
2. E. Coli: **absent**

REMARK:

Satisfactory

Wilfred Ntiamuah, MPH, CPHI(C)  
Regional Environmental Health Officer  
Kitikmeot Region - Dept. of Health & Social Services  
Helen Maksagak Centre, P.O. Box 83  
Cambridge Bay, NUNAVUT, X0B 0C0  
Phone: (867) 983-4236  
Email : [wntiamuah@gov.nu.ca](mailto:wntiamuah@gov.nu.ca)

# LABORATORY REPORT

**Cambridge Bay Water Laboratory**

**Reporting Date: August 09, 2013**

Reference Number 415-08-01

Source of water: Truck # 7449 - Hamlet of Gjoa Haven

Date & Time collected: August 07, 2013; 3:30 PM

Date & Time Received: August 08, 2013; 11:15 AM

TOTAL COLIFORM AND E. COLI TESTING (Present / Absent; Coli-ert method).

1. TOTAL COLIFORM: **absent**
2. E. Coli: **absent**

REMARK:

## Satisfactory

Wilfred Ntiamoah, MPH, CPHI(C)  
Regional Environmental Health Officer  
Kitikmeot Region - Dept. of Health & Social Services  
Helen Maksagak Centre, P.O. Box 83  
Cambridge Bay, NUNAVUT, X0B 0C0  
Phone: (867) 983-4236  
Email : [wntiamoah@gov.nu.ca](mailto:wntiamoah@gov.nu.ca).



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Department of Health  
Munaqhiliqiyitkut  
Ministère de la Santé

**Reporting Date: August 09, 2013**

Reference Number 415-08-01

Date & Time Received: August 08, 2013; 11:15 AM

TOTAL COLIFORM AND E. COLI TESTING (Present / Absent; Coli-ert method).

1. TOTAL COLIFORM: **absent**
2. E. Coli: **absent**

REMARK:

## Satisfactory

Wilfred Ntiamoah, MPH, CPHI(C)  
Regional Environmental Health Officer  
Kitikmeot Region - Dept. of Health & Social Services  
Helen Maksagak Centre, P.O. Box 83  
Cambridge Bay, NUNAVUT, X0B 0C0  
Phone: (867) 983-4236  
Email : [wntiamoah@gov.nu.ca](mailto:wntiamoah@gov.nu.ca).