

Department of Community and Government Services
Nunalingni Kavamatkunnilu Pivikhaqautikkut
Ministère des Services Communautaires et gouvernementaux

Gjoa Haven Water Licence: 3BM-GJO 1318 Annual Report 2013

February 20, 2014

Nunavut Water Board P.O. Box 119 Gjoa Haven, NU X0B 1L0

Attention: Phyllis Beaulieu, Manager of Licensing

RE: Annual Report 2013 - Hamlet of Gjoa Haven Water Licence: 3BM-GJO 1318

Dear Ms. Phyllis,

The Hamlet of Gjoa Haven is pleased to submit to Nunavut Water Board the attached file of "Annual Report 2013" of water uses and sewage solid waste disposal as required and directed under the compliance of Water Licence; 3BM-GJO-1318 as stated above. Copies of required tests reports are attached herewith (Appendices) as requested for your review and reference.

With the help of Government of Nunavut though Community and Government Services, the Hamlet has undertaken a comprehensive waste management program which has led to improve sewage and solid waste facilities, wetland and effluent discharge. The annual monitoring program for sewage and solid waste has been in effect during June- Aug each year since 2012. Samples test result has shown excellent control on contamination parameters within allowable limit comprising BOD, TSS, E-coli and Toxicity components. We summarized those conditions and requirements outlined in Part B through part H as below:

#### Part B: General conditions:

#### Item 1.( a through i):

- Tabular Form of Annual water consumption and sewage disposal are duly filled-up
- Quantities were measured on daily basis of water distribution and sewage disposal
- No modification to water supply or solid waste disposal during this period
- Only modification to sewage waste disposal into new sewage lagoon from Oct 03, 2013
- No unauthorized discharge or disposal to solid waste, but a continuous leak of sewage effluent
  into wetland from old sewage lagoon across the earth-gravel berm as reported. An overflow chute
  is set up in between the two cells of lagoon system to control the effluent flow from main cell to
  second cell.
- O&M manual for old sewage and solid waste facilities submitted on Aug 15, 2013 and approved.



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- O&M manual for new Sewage lagoon will be submitted expecting by June 2014.
- Review of Dam Safety inspection for old lagoon berm carried Sep 17-18, 2013 by exp consultant and report submitted to the Board.

#### Items 2-7:

- Monitoring stations marked at site using GPS locator and location signage placed, any missing signage will be installed by the Hamlet in summer 2014.
- No device Meter was used for volume measurement, however, truck-fill measurement uses as precise in taking the volume of water, sewage and solid waste.
- No Spill or emergency occurrences happened and reported during this period.
- No changes in Monitoring program as reported in QA/QC plan and Plan for Compliance.

#### Part C: Water Use:

• Water drawn from the Swan Lake as the only approved source and annual quantity 41,545 cubic metres limited within the allowable annual limit of 62,000 cubic metres.

#### Part D: Waste Disposal

- All sewage disposal to the old sewage Lagoon prior to Oct 03, 2013 and then into the new Lagoon from the day of operation starts Oct 03, 2013. Raw sewage waste collect from household sewage tank by hamlet operated vacuum trucks and operators.
- Sewage and effluent samples taken during summer and fall, tested in accredited laboratory and noted parameters contamination within allowable limits (Appendix C Test Reports).
- Final discharge points identified and submitted to the Board as required minimum 30 days after such point(s) identification. No changes in Final Discharge point and therefore no plan submitted to the Board for amendment as identified in Item 8
- Freeboard at sewage lagoon maintained minimum 1.0m (Ref. Item 3) and discharge into secondary cell for old lagoon through overflow control chute. Discharge from new lagoon to wetland waiting area through the controlled chute.
- The existing wetland area and facilities used for effluent treatment and remediation. Test results shown the effluent from Final Discharge Point GJO-4 within limiting values for BOD, TSS, Coliform, p<sup>H</sup> meeting quality standards and DFO guidelines.

#### Part E-G: Modification, construction, operation, abandonment and restoration

- New sewage lagoon project included liner berm and access road including a culvert, construction drawings submitted to the Board by the consultant. Diversion of sewage effluent discharge from the new lagoon connects the shallow path of wetland and monitoring stations.
- Abandonment of old sewage lagoon effective from Oct 03, 2013, decommissioning and remediation process plans in 2014-15.
- New O&M manual for new sewage system draft received, expecting final submission by June'14.



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#### Part H: Monitoring Program

- Annual monitoring of sewage and solid waste effluent has been carried from Stations GJO-2, GJO-4, and GJO-5 during the summer and fall. Samples were taken from monitoring stations where available and convenient, and tested for parameters at Taiga Laboratory at Yellowknife, NWT (CALA approved). Test reports of such samples as well as Bacterial Test (Taiga Lab and Cambridge Bay Regional Lab) are included with this report for your review and reference (Appendix B and C).
- Raw sewage collects by vacuum suction from household sewage tank using hamlet operated truck, haul to 1 km away sewage lagoon and offload on splash pad to lagoon station GJO-3.
   Number of truck load recorded on daily basis measures quantity of monthly and annually, not very quantity, but close to accuracy as possible. Truck driver/operator carries a Log sheet to be filled out for each load dispose to sewage lagoon. Full load capacity of sewage truck 10,000 liter.
- Location of monitoring stations marked on map with GPS coordinates.
- During the late summer and fall, monitoring stations GJO-2 and GJO-5 found dry and not enough
  collection or flow of effluent or leachate for sampling. Therefore, more numbers of samples were
  not possible except the one from GJO-4 for remaining samples.

We hope that Nunavut Water Board will find this report and enclosed test results valuable to Annual Report in operating the Water Licence for water, sewage and solid waste facilities as required and identified in the Licence.

Best Regards,

Shah Alam, P. Eng.

Municipal Planning Engineer,
Government of Nunavut

Community and Government Services

Kitikmeot Region, Cambridge Bay, Nu

Phone: 867-983-4156, fax: 867-983-4124

salam@gov.nu.ca<mailto:salam@gov.nu.ca>

## Gjoa Haven Water Licence 3BM-GJO1318

## **Annual Report 2013**

## Hamlet of Gjoa Haven, Nunavut

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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.

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 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.

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

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

- 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<sup>o</sup> 37 05 "and W 95<sup>o</sup> 50 44"

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

- 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.
- 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.

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

• 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:

- 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:

- 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

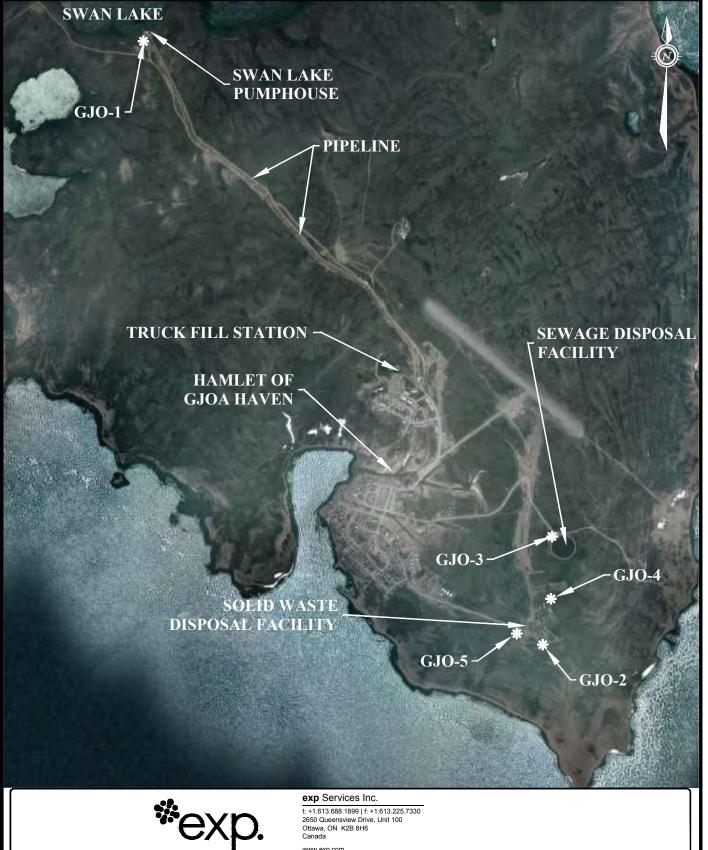
Wastewater/Sewage parameters

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





- BUILDINGS EARTH & ENVIRONMENT ENERGY •
- INDUSTRIAL INFRASTRUCTURE SUSTAINABILITY •

NTS	CLIENT:	OTT-00209248-A0
30/08/2013 drawn by E.A.	MONITORING STATION LOCATIONS	FIG 02

# Appendix B:

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



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

#### - 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:**

- For the thods 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
  - o Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
  - o Environment Canada
  - o 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





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

## - 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
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	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	
Inorganics - Nutrients						
Ammonia as Nitrogen	12.0	0.005	mg/L	11-Jul-13	SM4500-NH3:	
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	
Major Ions						
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 **Print Date:** Wednesday, July 17, 2013



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## - CERTIFICATE OF ANALYSIS -

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	
Organics						
Oil and Grease, visible	Non-visible			10-Jul-13	Visual Exam	
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	

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



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#### - 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 *	Qualifer
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	284	0.4	mg/L	06-Jul-13	SM2320:B	
Conductivity, Specific (@ 25°C)	1040	0.4	μS/cm	06-Jul-13	SM2510:B	
pН	7.98		pH units	06-Jul-13	SM4500-H:B	
Solids, Total Suspended	38	3	mg/L	07-Jul-13	SM2540:D	
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen	24.1	0.005	mg/L	11-Jul-13	SM4500-NH3:	
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	
Major Ions						
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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## - CERTIFICATE OF ANALYSIS -

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
<u>Organics</u>					
Oil and Grease, visible	Non-visible			10-Jul-13	Visual Exam
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

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



Taiga Batch No.: 130473

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

#### - CERTIFICATE OF ANALYSIS -

Client Sample ID: GJO-4 Taiga Sample ID: 002

## - DATA QUALIFERS -

Data Qualifier Descriptions:

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:** Wednesday, July 17, 2013 **Print Date:** Wednesday, July 17, 2013 Page 6 of 6



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

#### - 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:**

- For the 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
  - O Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
  - o Environment Canada
  - o 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 Page 1 of 6





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

## - 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
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	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	
Inorganics - Nutrients						
Ammonia as Nitrogen	18.1	0.005	mg/L	14-Aug-13	SM4500-NH3:	
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	
Major Ions						
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

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



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

## - CERTIFICATE OF ANALYSIS -

Client Sample ID: GJOA-02			Taiga	a Sample II	D: 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
<u>Organics</u>					
Oil and Grease, visible	Non-visible			14-Aug-13	Visual Exam
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 **Print Date:** Friday, August 16, 2013



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

#### - 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 *	Qualifer
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	322	0.4	mg/L	07-Aug-13	SM2320:B	
Conductivity, Specific (@ 25°C)	1130	0.4	μS/cm	07-Aug-13	SM2510:B	
рН	7.74		pH units	07-Aug-13	SM4500-H:B	
Solids, Total Suspended	16	3	mg/L	08-Aug-13	SM2540:D	
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen	21.2	0.005	mg/L	14-Aug-13	SM4500-NH3:	
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	
Major Ions						
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



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

## - 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	
<u>Organics</u>					
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 **Print Date:** Friday, August 16, 2013



Taiga Batch No.: 130622

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

#### - CERTIFICATE OF ANALYSIS -

Client Sample ID: GJOA-04 Taiga Sample ID: 002

## - DATA QUALIFERS -

Data Qualifier Descriptions:

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

#### 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: Pt. Phone: 8676694162

Room:

Location: EHO - KITTKMEOT

Adm. Date: 05/12/11

Encounter: WX00000000032

Attending Pract.: PHYSICIAN, NOT Requested by: PHYSICIAN, NOT

Send to: KITIKMEOT REGIONAL ENGINEER

KITIKMEOT MUNICIPAL

Copy to: EHO - KITIKMEOT, EHK KITIKMEOT REGIONAL.

Text Water 

KITIKMEOT REGIONAL ENGINEETER, KRE - Cambridge Buy NU,

\* FINAL

Source: Lake Water Water Truck 7449

Order#: 25080422

Collected: 07/01/13 00:01

Received: 08/01/13 15:27

09/01/13

13:17

Public, chlorinated water supp y

TOTAL COLIFORM & E.COLI TESTING (P/A

COLILERT METHOD)

09/01/13

TOTAL COLIFORM: absent

E.COLI: absent





#### 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: 25080423

Patient: GJOA HAVEN, HAMLET OF

DOB: HCN:

Age: 51

Sex: N Client ID: HX00000032

Stanton Chart No: Pt. Phone: 8676694162

Room:

Location: EHO - KITIKMEOT

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

Text. Water

09/01/13

## MICROBIOLOGY

KITIKMEOT REGIONAL ENGINEEER, KRE - Cambridge Bay NU.

\* FINAL

Source: Lake Water Water Truck 7660

Order#: 25080423

Collected: 07/01/13 00:01

Received: 08/01/13 15:28

Public, chlorinated water supp'y

TOTAL COLIFORM & E.COLI TESTING (P/A

COLILERT METHOD)

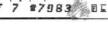
TOTAL COLIFORM: absent

E.COLI: absent

09/01/13 13:17



Printed: 01/09/13 13:39





#### 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: 25080424

States

Patient: GJOA HAVEN, HAMLET OF

DOB: HCN: Age: 51

Sex: N 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

KITIKMBOT MUNICIPAL

Teyl Water 

KITIKMEOT REGIONAL ENGINEEER, KRF - 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 COLILERT METHOD)

\* FINAL

09/01/13 13:17

09/01/13

TOTAL COLIFORM: absent

E,COLI: absent













#### Stanton Territorial Hospital Laboratory

Lab No. 27070140

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

Patient: GJOA HAVEN, HAMLET OF

DOB: HCN:

Agc: 51

Sex: N

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: KITTKMEOT REGIONAL ENGINEER

Copy to: EHO + KITIKMEOT, EHK KITIKMEOT REGIONAL KITIKMEOT MUNICIPAL

Test, Water 

MICROBIOLOGY

Requested on: 07/03/13/11:01

KITIKMEOT REGIONAL ENGINTEER, KRE Cambridge Bay NU.

Switcher

Source: Lake Water Water Truck H7660

Order#: 27070140

Collected: 06/03/13 15:00)

Received: 07/03/13 11:02

Public, chlorinated water supp y

TOTAL COLIFORM & E.COLI TESTING (P/A) COLILERT 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

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STATUS Page 1 of 1

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#### Stanton Territorial Hospital Laboratory

Lab No. 27070143

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: HCN-

Age: 51

Sex: N

Client ID: | HX00000032

Stanton Chart No: Pt. Phone: 8676694162

Location: EHO - KITIKMEOT

Room:

Adm. Date: 05/12/11

Encounter: WX00000000032

Attending Pract.: PHYSICIAN, NOT Requested by: PHYSICIAN, NOT

Send to: KITIKMEOT REGIONAL ENGINEER

Copy to: EHO - KITIKMEOT, EHK KITIKMEOT REGIONAL KITIKMEOT MUNICIPAL

Test, Water 

MICROBIOLOXY

Requested our 07/03/13/13/1902

KIJTIKMEOT REGIONAL ENGINEEER, KRE Cambridge Bay NU,

Switcher

Source: Lake Water Water Truck H7449

Collected: 06/03/13 15:00

Order#: 27070143

Received: 07/03/13 11:02

Public, chloringted water supp y

TOTAL COLIFORM & E.COLI TESTING (P/A

\* FINAL

15:47

COLILERT METHOD)

08/03/13

TOTAL COLIFORM: absent

E.COLI: absent

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

STATUS

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P.314

10:8679834123

MAR-11-2013 16:19 From: STANTON HOSPITAL LAB 8676694141



#### Stanton Territorial Hospital Laboratory

Lab No: 27070144

DI

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: HCN: Age: 51

Sex: N

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. WHICH

MICROBIOLOGY

Requested on: 07/03/13/11/02

KITIKMEOT REGIONAL ENGINEEER, KRE - Cambridge Bay NU.

Switcher

Source: Lake Water Water Truck H7448

Order# 27070144

Collected: 06/03/13 15:00

Received: 07/03/13 11:02

Public, chloringted water supp y

TOTAL COLIFORM & E.COLI TESTING (P/A

\* FINAL

08/03/13 15:47

COLILERT METHOD)

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 Free 1351 (d. 20 Printed: 03/08/13 16:09



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 # 7660 - Hamlet of Gjoa Haven

Date & Time collected: April 25, 2013; 11:40 AM Date & Time Received: April 26, 2013; 9:45 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



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; 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



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



Department of Health Munaqhiliqiyitkut Ministère de la Santé

#### 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; 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, XOB OCO

Phone: (867) 983-4236



#### 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; 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



#### LABORATORY REPORT

Cambridge Bay Water Laboratory Reporting Date: August 09, 2013

Reference Number 415-08-01

Source of water: Continue Care Centre - 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; 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