Annual Report -2017

Water Licence: 3BM-CAM 1520

Hamlet of Cambridge Bay, NU

Date: March 07, 2018

Submitted to:

Nunavut Water Board

March 07, 2018

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

Attention: Karen Kharyan, PhD, Manager of Licensing

RE: 3BM-CAM 1520 - Annual Report 2017, Hamlet of Cambridge Bay

Dear Mr. Karen,

The Hamlet of Cambridge Bay is pleased to submit to Nunavut Water Board the "**Annual Report 2017**" of water uses and sewage solid waste disposal as required and directed under the compliance of Water Licence 3BM-CAM-1520. Copies of required tests reports are included herewith for your reference.

The Licensee has continued the approved monitoring plan for sampling and testing of water, sewage effluent water and solid waste run-off as identified in the Licence. Samples were tested at the CALA accredited Taiga Laboratory in Yellowknife, most of those results shown excellent remediation of contamination parameters that stayed within allowable limits of BOD, TSS, E-coli Toxicity and trace metals components in water, sewage and solid waste effluents before supply for uses and discharge to water bodies.

We summarized those conditions and requirements outlined in Part B through part H.

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.

Best Regards,

Marla Limousin,
Senor Administrative Officer,
Hamlet of Cambridge Bay, NU

Cc:

Baba Pedersen, Resource management Officer, AANDC

3BM CAM 1520

Annual Report-2017

TABLE OF CONTENTS

EXECUTIVE SUMMARY:

This Annual Report 2017 for the Hamlet of Cambridge Bay (the Licensee) to the Nunavut Water Board (NWB) has been prepared to meet requirements of the Nunavut Water Board Licence 3BM - CAM1520, Part B General Conditions, through part H conditions to the monitoring program. This report covers the period from 01 January to 31 December 2017.

Water intake from Water Lake through twin intake pumps, delivered by 6 inch HDPE buried line to treatment plant where it treats through chlorination, medium filtration and UV system before truck fill from outside by hamlet operated water trucks. One Feed water tank and one treated water tank is used continuous water delivery and truck fill supply. Quantity of water uses about **86,896** m3, which has exceeded a bit from the allowable limit **86,200** annually. The increase in water intake involves partly due to the consumption by huge construction activities in the community including housing, new subdivision development, fuel storage tank farm, airport building and runway work, CHARS complex and residents, demolition of existing town water plant and improvement of water buried line and vaults in town and cleaning works hamlets facilities. The Licensee is anticipating the water consumption be reduced in coming year and expecting the quantity within 85,000 m3.

Sewage waste collected from household sewage tanks using hamlet operated vacuum trucks, hauled to sewage lagoon and discharged at designated dropping points. Raw sewage stayed frozen inside the lagoon during Sep - June for almost 10 months where received primary treatment naturally. Annual decanting carried during August 01-Sep 01 and reduced about 36,800 m3 sewage water to make room for new candidate sewage. Samples collected from designated monitoring stations and tested at Taiga Laboratory Yellowknife for parameters content compliance.

Waste batteries, waste oil and waste paint drums replaced inside C-cans and plan for shipping out. Regular waste disposed at the Solid waste facility using hamlet operated trucks and pushed down and covered with sand-gravels. Loose wastes, papers, boxes, and light woods were burnt onsite with control slow burning process and secured from wind flown out.

A private Land farm development in progress under a separate Licence 1BR-CST1723 and would be useful for community needs with identified rate payable to the owner under their administration and overseas by the hamlet. This facility would be available for other communities of Kitikmeot as needed. Hamlet of Cambridge (the Licensee) does not have additional facility for contaminated soil or spills remediation but a temporary storage inside the two lined cells inside the Metal dump site.

Some issues on water coloration and odour noted during the early spring when the new WTP starts operation and summer freshen at the water source. The colouration issues identified due to excess doses of Ferric Chloride (FeCl3) in raw water before filtration which would benefit the treatment process, but elevated the discolouration due to excess Manganese in water. The odour issue was temporary from the entrapped gas inside the frozen water layer which comes once in few years as of previous records and was overcome the issue by digging holes on frozen water by manual augur. The new WTP and High pressure lines are in operation and in-town plant and storage tank were demolished. Water samples test on monthly basis for EC, TC and Chemical tests for raw and treated water and sewage conducted in compliance to the Licence.

Part B: General Conditions:

- Tabular Form of Annual water consumption and sewage disposal are filled in NWB Form
- Quantities were measured on daily basis of water distribution and sewage disposal
- Existing natural Lake-lagoon in operation with identified drop-off and decanting locations.
- No modification to sewage waste, wetland or solid waste site during 2017
- No unauthorized discharge or disposal to effluent or waste during this period.
- O&M manuals for sewage and solid waste facilities remained active. O&M manual for new IPH was submitted to the Board and approved. Draft version of new WTP received and reviewed, but pending the Final submission.
- Monitoring stations locations marked with signs for water intake and sewage drop-off, decanting and on north berm of the lagoon
- No device Meter was used for volume measurement, however, truck-fill measurement uses
- Plan of Compliance remained active and implemented as approved by the Board.

Part C: Water Use:

- All water drawn from the Water Lake for annual demand which was about **86,200** cubic metres and just exceeded the allowable annual limit 85**,000** cubic metres, but expecting the supply demand will reduce in coming years once the huge construction works done and more temporary people in town for works will be reduced including water wastes. Only increase in user would be CHARS operation which is already identified in demand volume.
- No erosion at the new intake point or close proximity of pumphouse. Larger gravels and bollard protected the pumphouse side berm and truckfill turn around sloped to road.
- Intake water feeds directly to treatment system with pre-chlorination and stores inside a treated water tank after filtration, UV and post-chlorination then to truckfill for supply from outside of the building by two truckfill facilities. Water supply by hamlet operated trucks 7 days a week during regular hours and on call after hours.
- CHARS water receives from the last vault of buried loop line using own pump to house tank and distributes through pipes to tap. CHARS Research labs requires further treatment of the water in-house for the biological and chemical processes, but are not mandate for drinking or community uses or requirements to Canadian Drinking Water Guidelines.

Part D: Waste Disposal

- The municipal sewage waste contains both grey and black water; urinal& toilet flush water mix with bath & kitchen water in the same tank. Combined sewage stays inside the house tank for average 3-4 days before collecting by vacuum truck to discharge into the lagoon.
- Amount of sewage generated during this period 01 Jan - 31 Dec is less than 77,500 m3. Quantity of sewage is calculated considering 90-95 % of water supply by truck.
- All sewage and solid waste disposal done to the designated location of sewage lagoon and waste facility using hamlet operated trucks. Sewage and effluent samples were taken from location station CAM-3, CAM-4, CAM-5 and Final Discharge Point CAM-6, test results shown

contaminants parameters within allowable limits (FC: 10,000 CFU/dl; BOD_5:100; TSS: 120; P^H: 6-9; Oil & grease: none for stations CAM-5 and CAM-6). Results are attached including a summary.

- Freeboard at sewage lagoon remained more than1.0 m since it was decanted.
- The existing decanting filters, wetland area and gravel berm facilities used for effluent treatment and remediation. Test results shown the effluent from Final Discharge Point CAM-6 within limiting values.

Non-hazardous domestic Solid Waste:

- Solid wastes were disposed in the waste facility which is fenced all around and monitored with watch shade and cameras. Dump quantities are recorded in site log book. Solid waste run-off at the downstream sump where sampled and tested at Taiga Lab.
- Light materials, paper, paper boards and loose materials segregated and reduced by slow burning inside trench and pushed down burn ashes under the cover materials inside.
- Animal carcass stored and burred inside the designated cell and covered with sands.
- Waste and unused tires stockpiled inside the designated cell near outside the solid waste facility and plan for shredding to repurposing or bundled for shipping out.

Part E-G: Modification, construction, operation, A&R

- No modifications to sewage or solid waste facilities and operational plan since developed.
- SCADA control PLC and HMI units, flow rate, temperature and Chlorine measuring devices are all included at the new WTP and also at the Intake Pumphouse. Communication system between the Intake pumphouse and new WTP in plan and would be completed in summer. The operational manual and as-built drawing are ready for submission to the Board.
- O&M manual for new WTP Final version in progress and will be submitted separately once completed including as-built drawing.
- No spills occurred during this period. No reclamation to facilities and therefore, no activities related to vegetation growth or seed deposition carried.

Part H: Monitoring Program

- Annual monitoring of sewage and solid waste effluent has been carried during the summer and fall by the Licensee and the consultant contractor where engaged.
- Cleanup to water storage tank was carried due to the discoloration and odour issues in water and samples were tested before delivery.
- Effluent samples were taken from monitoring stations where available as indicated in Part H of the licence, tested at Taiga Laboratory, Yellowknife (CALA approved). Test results are included. Active Stations CAM-5 has been re-arranged on the wetland and the Final Discharge point CAM-6 with GPS system.

ANNUAL REPORT- 2017

YEAR BEING REPORTED: 2017

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water Licence 3BM- CAM 1520 issued to the Hamlet of Cambridge Bay

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	7,315,838.30	Same
February	7,129,028.31	Same
March	7,715,555.04	Same
April	6,931,766.30	Same
May	7,397,710.13	Same
June	7,312,419.88	Same
July	7,279,889.47	Same
August	7,651,565.19	Same
September	5,962,078.06	Same
October	8,495,498.85	Same
November	7,051,856.78	Same
December	6,651,916.35	Same
ANNUAL TOTAL	86,895,122.66	Same

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;

Water supply:

Water Treatment Plant substantially completed on March 31st 2017 and transferred to hamlet for operation. Major activities in the Water Treatment Plant include:

- Transportation of water to treatment plant through buried line from intake pumphouse
- Transfer of intake system from old pumphouse to new twin intake pumphouse system
- Addition of a truckfill facility at the intake pumphouse as a backup for emergency supply
- Filtration system to raw water with pre-chlorination and storage after 2nd chlorination
- UV system for more biological treatment followed by AdEdge sand medium filtration
- Chlorine feed tanks and Ferric Chloride feed (as needed) tank including pumps and filtration
- Backwash tank, treated water tank, new truckfill arms, back-up generator and heating system
- SCADA monitoring system and remote communication with operators and intake pumphouse
- New 200 mm HDPE buried line with new vaults for water supply to CHARS complex
- Re-arranging the town buried line by removal of existing recirculation line and integration Fire hydrants in locations of importance and near the major road intersections.
- Increase the supply flow-rate and to help high pressure system in water delivery
- New 200 mm buried line with new vaults loop return to WTP
- Gate system and site recording logs for metal dump and solid waste facilities.

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

No reported unauthorized discharge of water or sewage effluent during the reported period.
AANDC inspection on July 14, 2017 indicated and concerns for:

- Source water protection and control of flow in/out since no raised berm in between the Water Lake and the big Grenier Lake (which generates most of the water volume). Also access of wild animal and cabin waste leachates towards the water source is open.
- Sewage lagoon is fenced one side (south) with the solid waste, but no fence to other sides specifically to the north and east side; however west side is narrower and elevated.
- Metal dump is heaping near the berm with sewage lagoon and needs to be reduced; breaking to smaller pieces and secure inside or bury with cover materials.

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

- The town elevated water tank, plant building and truckfill facility were demolished and old vault ExAV-01 including the buried line connection has been abandoned.
- Restoration works to town water supply buried line carried including removal of existing 50 mm recirculation line and addition of necessary fittings and fire hydrants on locations.

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;

The AANDC inspector has noted little higher values of p^H in effluent samples from monitoring stations CAM-5 (decanted cell on wetland entry) and CAM-6 (Final discharge point), but has authorized the decanting program and advised to verify the causes either by effluent quality or samples taken earlier than expected.

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

Water flow meter reads water intake volume that goes to truckfill for community water supply, small quantity uses for backwash and tank cleanup. The truckfill quantity reports the Annual volume of water uses which sums from daily, weekly, and monthly records. Therefore, a small difference between the water intake total and water supply total, which are not recorded anywhere but can be calculated using the Flow meter readings and truck supply records. AANDC inspector wanted to keep such records to ensure the actual intake quantity. Also, use of flow meter readings can be helpful in maintaining the plant operation hours, switching intake pumps flow rate. But, no specific date or time mandated to report such calculation, just to keep records for information.

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

Draft O&M manual for new WTP has received and reviewed, waiting for the Final version. The O&M manual for the intake pumphouse has already submitted in previous year. Other O&M manuals for sewage and solid waste facilities are active and no changes to operation and plan.

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

Nunavut Water Board has issued a separate Licence **1BR-CST1723** to Kitnuna Environmental Ltd. (KEL), a private owner for the Soil remediation landfarm facilities in Cambridge Bay. Addition of this landfarm facility will bring benefits for the community, residential, housing, commercial, and institutional organization for spills and contaminated hydrocarbons.

Hamlet of Cambridge Bay is currently managing contaminated soil and spill materials storage only inside one of the two liner cells within the metal dump area, but no actual remediation process. The spill and contaminated materials only be stored inside a container, covered and place inside the liner cell confirming no leach or flow from the container into the liner cell. Empty drums, paint pails and other type of materials stored temporarily and subjected to transfer or removal in time.

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

The licensee has identified a very short summer for sewage effluent natural treatment using the short area wetland. Also, decanting might be started a bit earlier where raw sewage yet to complete the primary treatment cycle before going out for polishing work on wetland for which effluent sample results of July 2017 has shown a concern of little higher P^H value. Also, due to not have a

significant berm in between cells of sewage drop-off point and decanting point, a possibility of mixing the very raw sewage water all over inside the lagoon which decreases the maturity level of decanting candidate effluent. The inspector also concerns on floating debris and pieces of sludge blankets inside the lagoon banks which cleaning up would be required and thus helps in lagoon capacity and expedite the primary treatment process. The Licensee has a plan to follow up this concern in coming summer 2018, and sludge drying cell has already at the upper bank outside the lagoon. Other plans for waste reduction in next year 2018 include:

- Cleaning and shipping out batteries, waste oil, paints and hazardous materials from the facility
- Control burning of loose papers, boards, dry-wall components, waste beddings, waste cloths, waste doors-windows components and similar lightweight materials inside a trench.
- Crushing empty drums and tires and repurpose the shredded tire parts for community uses
- Push down the loose waste of solid waste and cover the compacted waste by soil-gravel
- Pick up those floated debris and dried sludge pieces from sewage facility and transfer them to sludge drying cell.
- Monitor the filtration system of the decanted filter funnel and gravel-berm on wetland before merging onto final discharge point CAM-6
- Putting those signs of sewage lagoon north-side and measure of protecting wild animal access
- Slow decanting onto wetland cell to help better prepared for final polishing and allows more vegetation growth on wetland.
- The recycling collection in effect at household level and materials transferred into the centralized facility for shipping out, which is a long term plan that will benefit the community.

MUNICIPALITY OF CAMBRIDGE BAY

SEPT/4/2017

RE: Sewage Lagoon Decanting.

The Hamlet started its sewage lagoon decanting on AUG 1st 2017 after receiving the go ahead to decant, we ran the pump on and off for better flow operations (shutting down on Friday afternoons) starting up again on Monday mornings. We finally shut down on SEPT 1ST 2017. This concludes the 2017 decanting season.

306.8 hrs x 2000 ltrs per Min x 60 divided by 1000 = 36,816 m ^{3} of decanting.

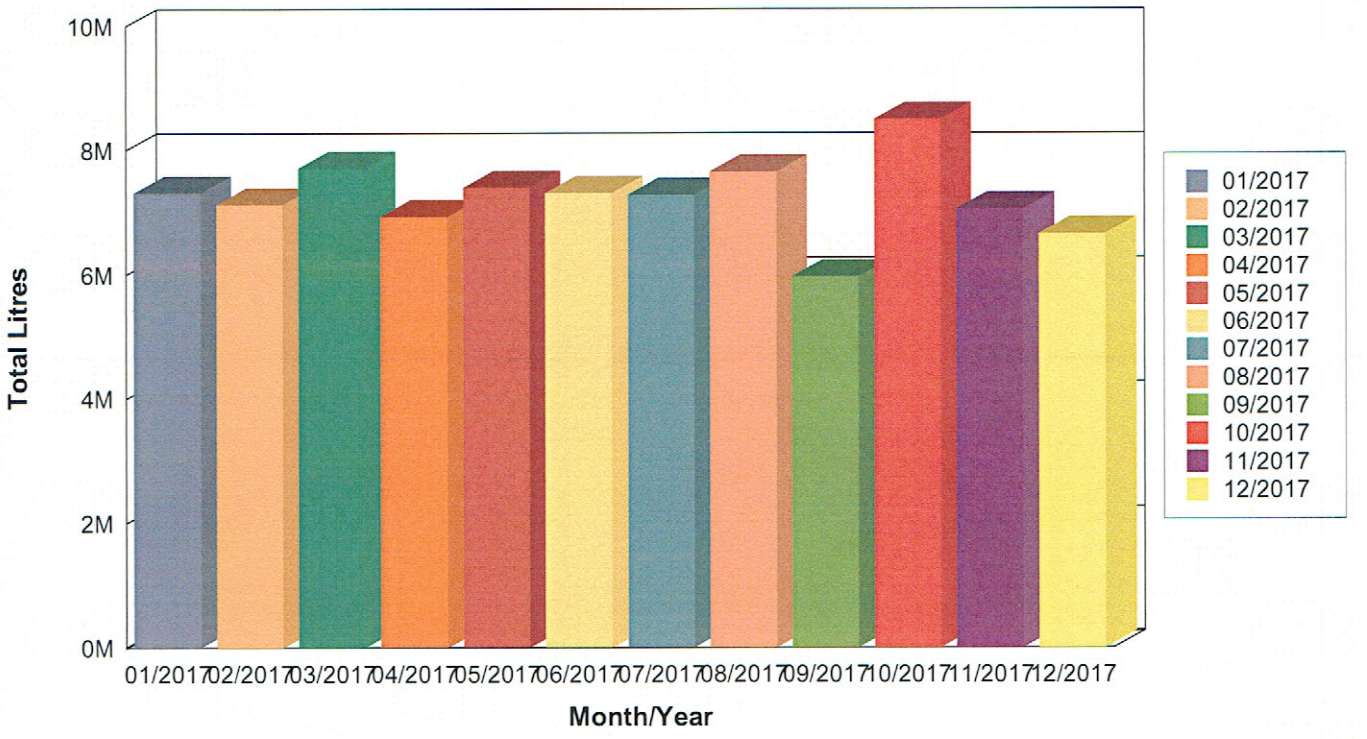
Regards

Wayne Weese

Wayne Weese
Director of Municipal Works
Cambridge Bay .NU
867 983 4666

Delivery Summary By Month and Year

Date Range From:Jan-01-2017 To: Dec-31-2017



Month / Year	Litres Delivered
January 2017	7,315,838.30
February 2017	7,129,028.31
March 2017	7,715,555.04
April 2017	6,931,766.30
May 2017	7,397,710.13
June 2017	7,312,419.88
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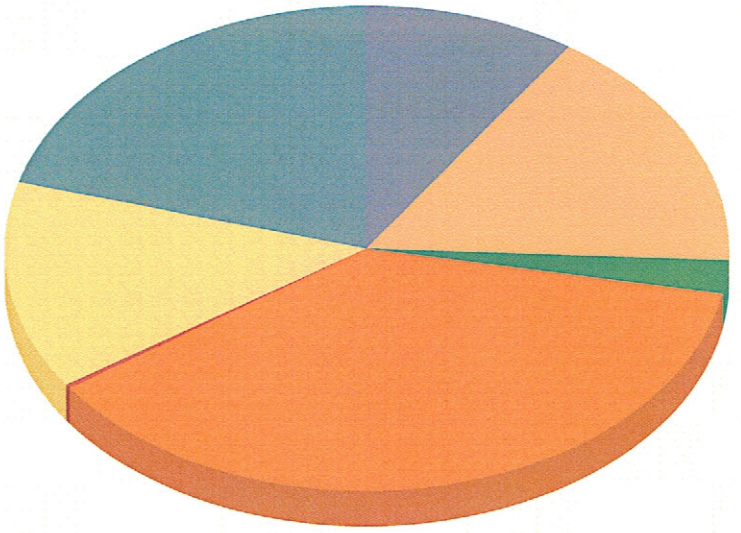
August 2017	7,651,565.19
September 2017	5,962,078.06
October 2017	8,495,498.85
November 2017	7,051,856.78
December 2017	6,651,916.35
Grand Total:	**86,895,122.66**

Delivery Summary By Water Rate

Date Range From:Jan-01-2017 To: Dec-31-2017



CG&S	9.4%
Commercial	16.3%
Hamlet	2.2%
Housing	37.2%
No Water Charge	0.3%
Other Full Econ.	13.8%
Private	20.7%
Total:	100.0%

Water Rate	Litres Delivered
CG&S	8,166,509.82
Commercial	14,177,620.48
Hamlet	1,924,583.30
Housing	32,337,897.18
No Water Charge	301,383.40
Other Full Econ.	12,034,111.30
Private	17,953,017.18
Grand Total:	**86,895,122.66**

TABLE: A

Water Test Results 2017

Water Licence: 3BM-CAM 1520

Hamlet of Cambridge Bay, NU

Community: Cambridge Bay **Water Analysis 2017**

Parameters		GCDWQ			Feb 21, 2017			Feb 21, 2017		
	Units	**Guideline**	**MAC**	**AO**	**Raw**	**Pre-treat**	**treated**	**H-01**	**RR-01**	**KHS**
Colour	TCU	2005		<=15	12	11	26	26	28	15
pH		2015		7.0 -10.5				0.71	0.95	0.52
Turbidity	NTU		1	<=5	0.55					
TDS		1991								
Alkalinity										
Conductivity										
Dissolve C	mg/L		45							
Total C	mg/L									
P, Total	mg/L									
Cyanide	mg/L	1991	0.2							
THMs	mg/L	2006	0.1							
Phenol, Tot										
Bromo-CH4										
Nitrate N	mg/L									
Hardness	mg/L									
Chloride	mg/L			<=250						
Fluoride	mg/L									
Sodium	mg/L	1979		<=200						
Sulphate	mg/L	1994		<=500						
Magnesium	mg/L									
Calcium	mg/L									
Potassium	mg/L									
Total Coli	CFU	2012	none					<1.0	<1.0	<1.0
E. Coli	CFU	2012	none					<1.0	<1.0	<1.0
Aluminium	µg/L	1998	ND	<100	0.7	<0.6	2.1	15	43.6	1.4
Arsenic	µg/L	2006	100	5	0.5	0.5	0.5	0.4	0.5	0.5
Barium	µg/L	1990	1000		56.6	55.7	53.5	55.5	54.9	48.8
Cadmium	µg/L	2005	5		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	µg/L	1986	50		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	µg/L	1992	ND	<=1000	3.4	4.9	22	11.3	67.1	1330
Iron	µg/L	2005	ND	<=300	85	83	83	82	101	77
Lead	µg/L	1992	10		0.2	1.1	4.6	0.4	0.8	1.4
Manganese	µg/L	1987	ND	<=50	78	79.4	79.8	76.2	96.7	109
Selenium	µg/L	2014	50		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Uranium	µg/L	1999	20							
Zinc	µg/L	2005	ND	<=5000	22.4	49.1	316	317	290	511
Mercury	µg/L	1986	1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	µg/L				0.1	0.2	1.1	0.3	0.3	0.5

GCDWQ=Guidelines for Canadian Drinking Water Quality, AO = Aesthetic Objectives

IMAC=Interim maximum acceptable concentration

MAC=Maximum acceptable concentration, ND=Not defined

Community: Cambridge Bay **Water Analysis 2017**

Parameters		GCDWQ			May 30, 2017					
	Units	**Guideline**	**MAC**	**AO**	**Raw**	**WTP-01**	**WTP02**	**HV 01**	**KHS01**	
Colour	TCU	2005		<=15	14	11	11	12	17	
pH		2015		7.0 -10.5	7.28	7.4	7.4	7.63	7.35	
Turbidity	NTU		1	<=5	1.02	1.09	1.34	0.95	1.07	
TDS		1991			369	359	397	372	366	
TSS					<3	4	<3	<3	<3	
Alkalinity					206	206	209	209	211	
Conductivity					707	718	734	737	743	
Dissolve C	mg/L		45		7.4	7.2	7.5	7.5	7.6	
Total C	mg/L				7.5	7.8	7.6	7.4	7.6	
P, Total	mg/L				0.007	0.005	0.005	0.003	0.005	
Cyanide	mg/L	1991	0.2		<0.001	<0.001	<0.001	<0.001	<0.001	
THMs	mg/L	2006	0.1			<0.005	0.006	0.005	0.006	
Phenol, Tot					0.0044	0.0032	0.0028	0.0029	0.0037	
Bromo-CH4						<0.005	<0.005	<0.005	<0.005	
Nitrate N	mg/L				0.4	0.2	0.22	0.22	0.21	
Hardness	mg/L				261	260	262	262	261	
Chloride	mg/L			<=250	90.5	93	96.9	97.1	97.6	
Fluoride	mg/L				0.2	0.2	0.2	0.2	0.2	
Sodium	mg/L	1979		<=200	46.3	48.7	51.1	51.1	51.3	
Sulphate	mg/L	1994		<=500	30	29	29	29	29	
Magnesium	mg/L				34.1	34	34.3	34.3	34.2	
Calcium	mg/L				48.4	47.9	48.3	48.3	48.2	
Potassium	mg/L				3.2	3.6	3.3	3.3	3.3	
Total Coli	CFU	2012	none		<1.0	<1.0	<1.0	<1.0	<1.0	
E. Coli	CFU	2012	none		<1.0	<1.0	<1.0	<1.0	<1.0	
Aluminium	µg/L	1998	ND	<100	0.8	0.8	1.0	28.5	1.1	
Arsenic	µg/L	2006	100	5	0.6	0.6	0.6	0.6	0.6	
Barium	µg/L	1990	1000		73.6	66.4	68.1	68.1	65.3	
Cadmium	µg/L	2005	5		<0.05	<0.05	<0.05	<0.05	<0.05	
Chromium	µg/L	1986	50		<0.1	<0.1	<0.1	<0.1	<0.1	
Copper	µg/L	1992	ND	<=1000	0.4	11.7	27.1	11.8	976	
Iron	µg/L	2005	ND	<=300	147	86	128	130	163	
Lead	µg/L	1992	10		<0.1	1.0	1.1	0.5	0.6	
Manganese	µg/L	1987	ND	<=50	148	156	218	217	277	
Selenium	µg/L	2014	50		<0.3	<0.3	<0.3	<03	<03	
Uranium	µg/L	1999	20							
Zinc	µg/L	2005	ND	<=5000	15.6	38.3	197	205	428	
Mercury	µg/L	1986	1		0.03	<0.01	<0.01	<0.01	<0.01	
Nickel	µg/L				0.5	0.2	0.3	0.3	0.5	

GCDWQ=Guidelines for Canadian Drinking Water Quality, AO = Aesthetic Objectives

IMAC=Interim maximum acceptable concentration

MAC=Maximum acceptable concentration, ND=Not defined

TABLE: B

Sewage Effluent Test Results 2017

Water Licence: 3BM-CAM 1520

Hamlet of Cambridge Bay, NU

Table: B

Effluent samples results 2017: Hamlet of Cambridge Bay, NU

Parameters	MAC Limit	units	July 18, 2017	July 18, 2017	July 18, 2017			
			CAM-3	**CAM-4**	**CAM-5**			
Alkalinity		mg/L	483	252	236			
Conductivity		µS/cm	3920	863	949			
P^H	6-9		7.80	8.62	9.29			
TSS	100	mg/L	97	91	71			
BOD	80	mg/L	2	2	2			
CBOD	200	mg/L	2	2	2			
Organic C, Dissolve	80	mg/L	0.5	0.5	0.5			
Organic C, Total	100	mg/L	0.5	0.5	0.5			
Phosphorus, Total		mg/L						
Nitrate as N2		mg/L	0.01					
Nitrite as N2		mg/L	0.01					
Calcium		mg/L						
Chloride	250	mg/L	0.7					
Hardness ($CaCO_3$)	500	mg/L	0.7					
Magnesium		mg/L	0.1					
Potassium		mg/L	0.1					
Sodium	200	mg/L	0.1					
Sulphate	500	mg/L	1					
Phenols, Total		mg/L	0.001					
Fecal Coliform	10^4	CFU/100mL	1					
Oil and Grease	5000	µg/L	None					
Aluminium	1000	µg/L	54.7	28.2	55.2			
Arsenic	1000	µg/L	5.3	1.4	3.9			
Cadmium	100	µg/L	< 0.1	< 0.1	<0.1			
Chromium	100	µg/L	1.9	0.2	0.3			
Cobalt	50	µg/L	2.7	0.4	0.4			
Copper	200	µg/L						
Iron	1000	µg/L	13700	322	250			
Lead	50	µg/L	5.4	< 0.1	0.7			
Manganese	50	µg/L	393	53	21.4			
Nickel	200	µg/L	23.8	2	3.5			
Zinc	500	µg/L	133	12.6	6.2			
Mercury (Hg)	1	µg/L	0.02	< 0.01	<0.01			

Parameters MAC value for **sewage effluent** identified in the Water Licence.

- Red fonts shows higher parameter values that requires more holding time before decanting/ discharge
- blue fonts shows values within allowable limit and ready for discharge the effluent water

Note: CAM-6 is Final Discharge point (end-of-pipe) and CAM-4 inside the Solid waste
CAM -3 is in the Sewage lagoon and CAM-5 is the decanted cell on wetland.

Pictures:

Water, Sewage and waste facilities

Water Licence: 3BM-CAM 1520

Hamlet of Cambridge Bay, NU

Pictures:

Pic 1: Water Lake

Pic 2: Water Truckfill

Pic 3: Waste battery storage

Pic 4: E-waste storage

Pic 5: Wetland and Station

Pic 6: Solid waste facility

Pictures:

Pic 7: Waste Oil storage and re-uses

Pic 8: Metal dump on site

Pic 9: Hazardous and battery securement

Pic 10: Contaminated soil and spills storage

Pic 11: Waste paint pail storage

Pic 12: Light wastes slow burning

Appendix: A

Water Test Results 2017

Water Licence: 3BM-CAM 1520

Hamlet of Cambridge Bay, NU

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170074

- PRELIMINARY REPORT -

Prepared For: Government of Nunavut

Address: Community and Government Services
P.O. Box 200
Cambridge Bay,NU
X0B 0C0

Attn: **Shah Alam** **Facsimile:**

Final report has been reviewed and approved by:

Judy Mah
Client Service 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) to ISO/IEC 17025 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:
Print Date: *Monday, February 27, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: IPH-01 **Taiga Sample ID:** 001

Client Project: CB Water Supply
Sample Type: Raw Water
Received Date: 21-Feb-17
Sampling Date: 21-Feb-17
Sampling Time: 9:00
Location: Cambridge Bay, NU
Report Status: **Preliminary**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Organic Carbon, Dissolved		0.5	mg/L		SM5310:B	
Organic Carbon, Total		0.5	mg/L		SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)		0.4	mg/L		SM2320:B	
Colour, Apparent	12	5	CU	23-Feb-17	SM2120:B	
Conductivity, Specific (@25C)		0.4	µS/cm		SM2510:B	
pH			pH units		SM4500-H:B	
Solids, Total Dissolved		10	mg/L		SM2540:C	
Solids, Total Suspended		3	mg/L		SM2540:D	
Turbidity	0.55	0.05	NTU	23-Feb-17	SM2130:B	
Major Ions						
Calcium		0.1	mg/L		SM4110:B	
Chloride		0.7	mg/L		SM4110:B	
Fluoride		0.1	mg/L		SM4110:B	
Hardness		0.7	mg/L		SM4110:B	

ReportDate:
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Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: IPH-01 **Taiga Sample ID:** 001

Magnesium		0.1	mg/L		SM4110:B
Nitrate as Nitrogen		0.01	mg/L		SM4110:B
Potassium		0.1	mg/L		SM4110:B
Sodium		0.1	mg/L		SM4110:B
Sulphate		1	mg/L		SM4110:B
Microbiology					
Coliforms, Total		1.0	MPN/100ml		SM9223:B
Escherichia coli		1.0	MPN/100ml		SM9223:B
Organics					
Bromodichloromethane		0.005	mg/L		EPA8260B
Bromoform		0.005	mg/L		EPA8260B
Chloroform		0.005	mg/L		EPA8260B
Dibromochloromethane		0.005	mg/L		EPA8260B
Trihalomethanes, Total		0.005	mg/L		EPA8260B
Subcontracted Organics					
Cyanide, Weak Acid Dissociable		0.005	mg/L		APHA4500-CN
Trace Metals, Total					
Aluminum	0.7	0.6	µg/L	24-Feb-17	EPA200.8
Arsenic	0.5	0.2	µg/L	24-Feb-17	EPA200.8
Barium	56.6	0.1	µg/L	24-Feb-17	EPA200.8
Cadmium	< 0.05	0.05	µg/L	24-Feb-17	EPA200.8
Chromium	< 0.1	0.1	µg/L	24-Feb-17	EPA200.8
Copper	3.4	0.2	µg/L	24-Feb-17	EPA200.8
Iron	85	5	µg/L	24-Feb-17	EPA200.8
Lead	0.2	0.1	µg/L	24-Feb-17	EPA200.8

ReportDate:
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Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: IPH-01 **Taiga Sample ID:** 001

Manganese	78.0	0.1	µg/L	24-Feb-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	24-Feb-17	EPA200.8
Nickel	0.1	0.1	µg/L	24-Feb-17	EPA200.8
Selenium	< 0.3	0.3	µg/L	24-Feb-17	EPA200.8
Silver	< 0.1	0.1	µg/L	24-Feb-17	EPA200.8
Zinc	22.4	0.4	µg/L	24-Feb-17	EPA200.8

ReportDate:
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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP-01 **Taiga Sample ID:** 002

Client Project: CB Water Supply
Sample Type: Pre-treated (WTP)
Received Date: 21-Feb-17
Sampling Date: 21-Feb-17
Sampling Time: 9:30
Location: Cambridge Bay, NU
Report Status: **Preliminary**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Organic Carbon, Dissolved		0.5	mg/L		SM5310:B	
Organic Carbon, Total		0.5	mg/L		SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)		0.4	mg/L		SM2320:B	
Colour, Apparent	11	5	CU	23-Feb-17	SM2120:B	
Conductivity, Specific (@25C)		0.4	µS/cm		SM2510:B	
pH			pH units		SM4500-H:B	
Solids, Total Dissolved		10	mg/L		SM2540:C	
Solids, Total Suspended		3	mg/L		SM2540:D	
Turbidity	0.50	0.05	NTU	23-Feb-17	SM2130:B	
Major Ions						
Calcium		0.1	mg/L		SM4110:B	
Chloride		0.7	mg/L		SM4110:B	
Fluoride		0.1	mg/L		SM4110:B	
Hardness		0.7	mg/L		SM4110:B	
Magnesium		0.1	mg/L		SM4110:B	

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Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP-01 **Taiga Sample ID:** 002

Nitrate as Nitrogen		0.01	mg/L		SM4110:B
Potassium		0.1	mg/L		SM4110:B
Sodium		0.1	mg/L		SM4110:B
Sulphate		1	mg/L		SM4110:B
Microbiology					
Coliforms, Total		1.0	MPN/100ml		SM9223:B
Escherichia coli		1.0	MPN/100ml		SM9223:B
Organics					
Bromodichloromethane		0.005	mg/L		EPA8260B
Bromoform		0.005	mg/L		EPA8260B
Chloroform		0.005	mg/L		EPA8260B
Dibromochloromethane		0.005	mg/L		EPA8260B
Trihalomethanes, Total		0.005	mg/L		EPA8260B
Subcontracted Organics					
Cyanide, Weak Acid Dissociable		0.005	mg/L		APHA4500-CN
Trace Metals, Total					
Aluminum	< 0.6	0.6	µg/L	24-Feb-17	EPA200.8
Arsenic	0.5	0.2	µg/L	24-Feb-17	EPA200.8
Barium	55.7	0.1	µg/L	24-Feb-17	EPA200.8
Cadmium	< 0.05	0.05	µg/L	24-Feb-17	EPA200.8
Chromium	< 0.1	0.1	µg/L	24-Feb-17	EPA200.8
Copper	4.9	0.2	µg/L	24-Feb-17	EPA200.8
Iron	83	5	µg/L	24-Feb-17	EPA200.8
Lead	1.1	0.1	µg/L	24-Feb-17	EPA200.8
Manganese	79.4	0.1	µg/L	24-Feb-17	EPA200.8

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Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP-01 **Taiga Sample ID:** 002

Mercury	< 0.01	0.01	µg/L	24-Feb-17	EPA200.8
Nickel	0.2	0.1	µg/L	24-Feb-17	EPA200.8
Selenium	< 0.3	0.3	µg/L	24-Feb-17	EPA200.8
Silver	< 0.1	0.1	µg/L	24-Feb-17	EPA200.8
Zinc	49.1	0.4	µg/L	24-Feb-17	EPA200.8

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Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP-02 **Taiga Sample ID:** 003

Client Project: CB Water Supply
Sample Type: Treated (WTP)
Received Date: 21-Feb-17
Sampling Date: 21-Feb-17
Sampling Time: 9:45
Location: Cambridge Bay, NU
Report Status: **Preliminary**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Organic Carbon, Dissolved		0.5	mg/L		SM5310:B	
Organic Carbon, Total		0.5	mg/L		SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)		0.4	mg/L		SM2320:B	
Colour, Apparent	26	5	CU	23-Feb-17	SM2120:B	
Conductivity, Specific (@25C)		0.4	µS/cm		SM2510:B	
pH			pH units		SM4500-H:B	
Solids, Total Dissolved		10	mg/L		SM2540:C	
Solids, Total Suspended		3	mg/L		SM2540:D	
Turbidity	0.63	0.05	NTU	23-Feb-17	SM2130:B	
Major Ions						
Calcium		0.1	mg/L		SM4110:B	
Chloride		0.7	mg/L		SM4110:B	
Fluoride		0.1	mg/L		SM4110:B	
Hardness		0.7	mg/L		SM4110:B	
Magnesium		0.1	mg/L		SM4110:B	

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Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP-02 **Taiga Sample ID:** 003

Nitrate as Nitrogen		0.01	mg/L		SM4110:B
Potassium		0.1	mg/L		SM4110:B
Sodium		0.1	mg/L		SM4110:B
Sulphate		1	mg/L		SM4110:B
Microbiology					
Coliforms, Total		1.0	MPN/100ml		SM9223:B
Escherichia coli		1.0	MPN/100ml		SM9223:B
Organics					
Bromodichloromethane		0.005	mg/L		EPA8260B
Bromoform		0.005	mg/L		EPA8260B
Chloroform		0.005	mg/L		EPA8260B
Dibromochloromethane		0.005	mg/L		EPA8260B
Trihalomethanes, Total		0.005	mg/L		EPA8260B
Subcontracted Organics					
Cyanide, Weak Acid Dissociable		0.005	mg/L		APHA4500-CN
Trace Metals, Total					
Aluminum	2.1	0.6	µg/L	24-Feb-17	EPA200.8
Arsenic	0.5	0.2	µg/L	24-Feb-17	EPA200.8
Barium	53.5	0.1	µg/L	24-Feb-17	EPA200.8
Cadmium	< 0.05	0.05	µg/L	24-Feb-17	EPA200.8
Chromium	0.1	0.1	µg/L	24-Feb-17	EPA200.8
Copper	22.0	0.2	µg/L	24-Feb-17	EPA200.8
Iron	83	5	µg/L	24-Feb-17	EPA200.8
Lead	4.6	0.1	µg/L	24-Feb-17	EPA200.8
Manganese	79.8	0.1	µg/L	24-Feb-17	EPA200.8

ReportDate:
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Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP-02 **Taiga Sample ID:** 003

Mercury	< 0.01	0.01	µg/L	24-Feb-17	EPA200.8
Nickel	1.1	0.1	µg/L	24-Feb-17	EPA200.8
Selenium	< 0.3	0.3	µg/L	24-Feb-17	EPA200.8
Silver	< 0.1	0.1	µg/L	24-Feb-17	EPA200.8
Zinc	316	0.4	µg/L	24-Feb-17	EPA200.8

ReportDate:
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Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: HT-01 **Taiga Sample ID:** 004

Client Project: CB Water Supply
Sample Type: Water Truck
Received Date: 21-Feb-17
Sampling Date: 21-Feb-17
Sampling Time: 10:30
Location: Cambridge Bay, NU
Report Status: **Preliminary**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Organic Carbon, Dissolved		0.5	mg/L		SM5310:B	
Organic Carbon, Total		0.5	mg/L		SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)		0.4	mg/L		SM2320:B	
Colour, Apparent	26	5	CU	23-Feb-17	SM2120:B	
Conductivity, Specific (@25C)		0.4	µS/cm		SM2510:B	
pH			pH units		SM4500-H:B	
Solids, Total Dissolved		10	mg/L		SM2540:C	
Solids, Total Suspended		3	mg/L		SM2540:D	
Turbidity	0.71	0.05	NTU	23-Feb-17	SM2130:B	
Major Ions						
Calcium		0.1	mg/L		SM4110:B	
Chloride		0.7	mg/L		SM4110:B	
Fluoride		0.1	mg/L		SM4110:B	
Hardness		0.7	mg/L		SM4110:B	
Magnesium		0.1	mg/L		SM4110:B	

ReportDate:
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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: HT-01 **Taiga Sample ID:** 004

Nitrate as Nitrogen			0.01	mg/L		SM4110:B
Potassium			0.1	mg/L		SM4110:B
Sodium			0.1	mg/L		SM4110:B
Sulphate			1	mg/L		SM4110:B
Microbiology						
Coliforms, Fecal			1	CFU/100mL		SM9222:D
Coliforms, Total	<	1.0	1.0	MPN/100ml	22-Feb-17	SM9223:B
Escherichia coli	<	1.0	1.0	MPN/100ml	22-Feb-17	SM9223:B
Organics						
Bromodichloromethane			0.005	mg/L		EPA8260B
Bromoform			0.005	mg/L		EPA8260B
Chloroform			0.005	mg/L		EPA8260B
Dibromochloromethane			0.005	mg/L		EPA8260B
Trihalomethanes, Total			0.005	mg/L		EPA8260B
Subcontracted Organics						
Cyanide, Weak Acid Dissociable			0.005	mg/L		APHA4500-CN
Trace Metals, Total						
Aluminum		15.0	0.6	µg/L	24-Feb-17	EPA200.8
Arsenic		0.4	0.2	µg/L	24-Feb-17	EPA200.8
Barium		55.5	0.1	µg/L	24-Feb-17	EPA200.8
Cadmium	<	0.05	0.05	µg/L	24-Feb-17	EPA200.8
Chromium	<	0.1	0.1	µg/L	24-Feb-17	EPA200.8
Copper		11.3	0.2	µg/L	24-Feb-17	EPA200.8
Iron		82	5	µg/L	24-Feb-17	EPA200.8
Lead		0.4	0.1	µg/L	24-Feb-17	EPA200.8

ReportDate:
Print Date: *Monday, February 27, 2017*

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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: HT-01 **Taiga Sample ID:** 004

Manganese	76.2	0.1	µg/L	24-Feb-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	24-Feb-17	EPA200.8
Nickel	0.3	0.1	µg/L	24-Feb-17	EPA200.8
Selenium	< 0.3	0.3	µg/L	24-Feb-17	EPA200.8
Silver	< 0.1	0.1	µg/L	24-Feb-17	EPA200.8
Zinc	317	0.4	µg/L	24-Feb-17	EPA200.8

ReportDate:
Print Date: *Monday, February 27, 2017*

Taiga Environmental Laboratory
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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: PR-01 **Taiga Sample ID:** 005

Client Project: CB Water Supply
Sample Type: Private Residence
Received Date: 21-Feb-17
Sampling Date: 21-Feb-17
Sampling Time: 10:15
Location: Cambridge Bay, NU
Report Status: **Preliminary**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Organic Carbon, Dissolved		0.5	mg/L		SM5310:B	
Organic Carbon, Total		0.5	mg/L		SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)		0.4	mg/L		SM2320:B	
Colour, Apparent	28	5	CU	23-Feb-17	SM2120:B	
Conductivity, Specific (@25C)		0.4	µS/cm		SM2510:B	
pH			pH units		SM4500-H:B	
Solids, Total Dissolved		10	mg/L		SM2540:C	
Solids, Total Suspended		3	mg/L		SM2540:D	
Turbidity	0.95	0.05	NTU	23-Feb-17	SM2130:B	
Major Ions						
Calcium		0.1	mg/L		SM4110:B	
Chloride		0.7	mg/L		SM4110:B	
Fluoride		0.1	mg/L		SM4110:B	
Hardness		0.7	mg/L		SM4110:B	
Magnesium		0.1	mg/L		SM4110:B	

ReportDate:
Print Date: *Monday, February 27, 2017*

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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: PR-01 **Taiga Sample ID:** 005

Nitrate as Nitrogen			0.01	mg/L		SM4110:B
Potassium			0.1	mg/L		SM4110:B
Sodium			0.1	mg/L		SM4110:B
Sulphate			1	mg/L		SM4110:B
Microbiology						
Coliforms, Fecal			1	CFU/100mL		SM9222:D
Coliforms, Total	<	1.0	1.0	MPN/100ml	22-Feb-17	SM9223:B
Escherichia coli	<	1.0	1.0	MPN/100ml	22-Feb-17	SM9223:B
Organics						
Bromodichloromethane			0.005	mg/L		EPA8260B
Bromoform			0.005	mg/L		EPA8260B
Chloroform			0.005	mg/L		EPA8260B
Dibromochloromethane			0.005	mg/L		EPA8260B
Trihalomethanes, Total			0.005	mg/L		EPA8260B
Subcontracted Organics						
Cyanide, Weak Acid Dissociable			0.005	mg/L		APHA4500-CN
Trace Metals, Total						
Aluminum		43.6	0.6	µg/L	24-Feb-17	EPA200.8
Arsenic		0.5	0.2	µg/L	24-Feb-17	EPA200.8
Barium		54.9	0.1	µg/L	24-Feb-17	EPA200.8
Cadmium	<	0.05	0.05	µg/L	24-Feb-17	EPA200.8
Chromium	<	0.1	0.1	µg/L	24-Feb-17	EPA200.8
Copper		67.1	0.2	µg/L	24-Feb-17	EPA200.8
Iron		101	5	µg/L	24-Feb-17	EPA200.8
Lead		0.8	0.1	µg/L	24-Feb-17	EPA200.8

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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: PR-01 **Taiga Sample ID:** 005

Manganese	96.7	0.1	µg/L	24-Feb-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	24-Feb-17	EPA200.8
Nickel	0.3	0.1	µg/L	24-Feb-17	EPA200.8
Selenium	< 0.3	0.3	µg/L	24-Feb-17	EPA200.8
Silver	< 0.1	0.1	µg/L	24-Feb-17	EPA200.8
Zinc	290	0.4	µg/L	24-Feb-17	EPA200.8

ReportDate:
Print Date: *Monday, February 27, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: KHS-01 **Taiga Sample ID:** 006

Client Project: CB Water Supply
Sample Type: High School
Received Date: 21-Feb-17
Sampling Date: 21-Feb-17
Sampling Time: 10:00
Location: Cambridge Bay, NU
Report Status: **Preliminary**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Organic Carbon, Dissolved		0.5	mg/L		SM5310:B	
Organic Carbon, Total		0.5	mg/L		SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)		0.4	mg/L		SM2320:B	
Colour, Apparent	15	5	CU	23-Feb-17	SM2120:B	
Conductivity, Specific (@25C)		0.4	µS/cm		SM2510:B	
pH			pH units		SM4500-H:B	
Solids, Total Dissolved		10	mg/L		SM2540:C	
Solids, Total Suspended		3	mg/L		SM2540:D	
Turbidity	0.52	0.05	NTU	23-Feb-17	SM2130:B	
Major Ions						
Calcium		0.1	mg/L		SM4110:B	
Chloride		0.7	mg/L		SM4110:B	
Fluoride		0.1	mg/L		SM4110:B	
Hardness		0.7	mg/L		SM4110:B	
Magnesium		0.1	mg/L		SM4110:B	

ReportDate:
Print Date: *Monday, February 27, 2017*

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Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: KHS-01 **Taiga Sample ID:** 006

Nitrate as Nitrogen		0.01	mg/L		SM4110:B	
Potassium		0.1	mg/L		SM4110:B	
Sodium		0.1	mg/L		SM4110:B	
Sulphate		1	mg/L		SM4110:B	
Microbiology						
Coliforms, Fecal		1	CFU/100mL		SM9222:D	
Coliforms, Total	< 1.0	1.0	MPN/100ml	22-Feb-17	SM9223:B	
Escherichia coli	< 1.0	1.0	MPN/100ml	22-Feb-17	SM9223:B	
Organics						
Bromodichloromethane		0.005	mg/L		EPA8260B	85
Bromoform		0.005	mg/L		EPA8260B	85
Chloroform		0.005	mg/L		EPA8260B	85
Dibromochloromethane		0.005	mg/L		EPA8260B	85
Trihalomethanes, Total		0.005	mg/L		EPA8260B	85
Subcontracted Organics						
Cyanide, Weak Acid Dissociable		0.005	mg/L		APHA4500-CN	
Trace Metals, Total						
Aluminum	1.4	0.6	µg/L	24-Feb-17	EPA200.8	
Arsenic	0.5	0.2	µg/L	24-Feb-17	EPA200.8	
Barium	48.8	0.1	µg/L	24-Feb-17	EPA200.8	
Cadmium	< 0.05	0.05	µg/L	24-Feb-17	EPA200.8	
Chromium	< 0.1	0.1	µg/L	24-Feb-17	EPA200.8	
Copper	1330	0.2	µg/L	24-Feb-17	EPA200.8	
Iron	77	5	µg/L	24-Feb-17	EPA200.8	
Lead	1.4	0.1	µg/L	24-Feb-17	EPA200.8	

ReportDate:
Print Date: *Monday, February 27, 2017*

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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: KHS-01 **Taiga Sample ID:** 006

Manganese	109	0.1	µg/L	24-Feb-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	24-Feb-17	EPA200.8
Nickel	0.5	0.1	µg/L	24-Feb-17	EPA200.8
Selenium	< 0.3	0.3	µg/L	24-Feb-17	EPA200.8
Silver	< 0.1	0.1	µg/L	24-Feb-17	EPA200.8
Zinc	511	0.4	µg/L	24-Feb-17	EPA200.8

ReportDate:
Print Date: *Monday, February 27, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170074

- CERTIFICATE OF ANALYSIS -

Client Sample ID: KHS-01 **Taiga Sample ID:** 006

- DATA QUALIFERS -

Data Qualifier Descriptions:

85 *Equipment/supply failure, insufficient sample to repeat measurement.*

*** 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:

Print Date: *Monday, February 27, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
170390

- FINAL REPORT -

Prepared For: Government of Nunavut

Address: Community and Government Services
P.O. Box 200
Cambridge Bay,NU
X0B 0C0

Attn: **Mustafa Azmal** **Facsimile:**

Final report has been reviewed and approved by:

Glen Hudy
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) to ISO/IEC 17025 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 05, 2017
Print Date: ***Friday, July 07, 2017***

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170390

- CERTIFICATE OF ANALYSIS -

Client Sample ID: FeCl3 **Taiga Sample ID:** 001

Client Project:
Sample Type: Ferric Chloride
Received Date: 19-Jun-17
Sampling Date: 30-May-17
Sampling Time: 9:30
Location: Water Treatment Plant
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Trace Metals, Dissolved						
Aluminum	354000	600	µg/L	05-Jul-17	EPA200.8	
Antimony	< 100.0	100	µg/L	05-Jul-17	EPA200.8	
Arsenic	1500	200	µg/L	05-Jul-17	EPA200.8	
Barium	780	100	µg/L	05-Jul-17	EPA200.8	
Beryllium	< 100.0	100	µg/L	05-Jul-17	EPA200.8	
Bismuth	< 200	200	µg/L	05-Jul-17	EPA200.8	
Boron	10700	900	µg/L	05-Jul-17	EPA200.8	
Cadmium	1950	40	µg/L	05-Jul-17	EPA200.8	
Cesium	< 100.0	100	µg/L	05-Jul-17	EPA200.8	
Chromium	828000	100	µg/L	05-Jul-17	EPA200.8	
Cobalt	23400	100	µg/L	05-Jul-17	EPA200.8	
Copper	161000	200	µg/L	05-Jul-17	EPA200.8	
Iron	195000000	5000	µg/L	05-Jul-17	EPA200.8	
Lead	11100	100	µg/L	05-Jul-17	EPA200.8	
Lithium	< 200	200	µg/L	05-Jul-17	EPA200.8	

ReportDate: Wednesday, July 05, 2017
Print Date: ***Friday, July 07, 2017***

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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170390

- CERTIFICATE OF ANALYSIS -

Client Sample ID: FeCl3 **Taiga Sample ID:** 001

Manganese	1080000	100	µg/L	05-Jul-17	EPA200.8
Mercury	44.2	10	µg/L	05-Jul-17	EPA200.8
Molybdenum	14300	100	µg/L	05-Jul-17	EPA200.8
Nickel	468000	100	µg/L	05-Jul-17	EPA200.8
Rubidium	< 100.0	100	µg/L	05-Jul-17	EPA200.8
Selenium	< 300	300	µg/L	05-Jul-17	EPA200.8
Silver	< 100.0	100	µg/L	05-Jul-17	EPA200.8
Strontium	3020	100	µg/L	05-Jul-17	EPA200.8
Thallium	< 100.0	100	µg/L	05-Jul-17	EPA200.8
Tin	106000	100	µg/L	05-Jul-17	EPA200.8
Titanium	9860	100	µg/L	05-Jul-17	EPA200.8
Uranium	< 100.0	100	µg/L	05-Jul-17	EPA200.8
Vanadium	< 100.0	100	µg/L	05-Jul-17	EPA200.8
Zinc	950000	400	µg/L	05-Jul-17	EPA200.8

ReportDate: Wednesday, July 05, 2017
Print Date: *Friday, July 07, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170390

- CERTIFICATE OF ANALYSIS -

Client Sample ID: NaClO **Taiga Sample ID:** 002

Client Project:
Sample Type: Sodium Hypochloride
Received Date: 19-Jun-17
Sampling Date: 30-May-17
Sampling Time: 9:30
Location: Water Treatment Plant
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Trace Metals, Dissolved						
Aluminum	408	60	µg/L	05-Jul-17	EPA200.8	
Antimony	< 10.0	10	µg/L	05-Jul-17	EPA200.8	
Arsenic	< 20.0	20	µg/L	05-Jul-17	EPA200.8	
Barium	< 10.0	10	µg/L	05-Jul-17	EPA200.8	
Beryllium	< 10.0	10	µg/L	05-Jul-17	EPA200.8	
Bismuth	< 20.0	20	µg/L	05-Jul-17	EPA200.8	
Boron	123	90	µg/L	05-Jul-17	EPA200.8	
Cadmium	< 4.00	4	µg/L	05-Jul-17	EPA200.8	
Cesium	< 10.0	10	µg/L	05-Jul-17	EPA200.8	
Chromium	234	10	µg/L	05-Jul-17	EPA200.8	
Cobalt	< 10.0	10	µg/L	05-Jul-17	EPA200.8	
Copper	< 20.0	20	µg/L	05-Jul-17	EPA200.8	
Iron	3470	500	µg/L	05-Jul-17	EPA200.8	
Lead	82.4	10	µg/L	05-Jul-17	EPA200.8	
Lithium	40.0	20	µg/L	05-Jul-17	EPA200.8	
Manganese	19.9	10	µg/L	05-Jul-17	EPA200.8	

ReportDate: Wednesday, July 05, 2017
Print Date: ***Friday, July 07, 2017***

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170390

- CERTIFICATE OF ANALYSIS -

Client Sample ID: NaClO **Taiga Sample ID:** 002

Mercury	12.7	1	µg/L	05-Jul-17	EPA200.8
Molybdenum	22.2	10	µg/L	05-Jul-17	EPA200.8
Nickel	< 10.0	10	µg/L	05-Jul-17	EPA200.8
Rubidium	295	10	µg/L	05-Jul-17	EPA200.8
Selenium	< 30.0	30	µg/L	05-Jul-17	EPA200.8
Silver	< 10.0	10	µg/L	05-Jul-17	EPA200.8
Strontium	20.4	10	µg/L	05-Jul-17	EPA200.8
Thallium	< 10.0	10	µg/L	05-Jul-17	EPA200.8
Tin	45.4	10	µg/L	05-Jul-17	EPA200.8
Titanium	< 10.0	10	µg/L	05-Jul-17	EPA200.8
Uranium	< 10.0	10	µg/L	05-Jul-17	EPA200.8
Vanadium	< 10.0	10	µg/L	05-Jul-17	EPA200.8
Zinc	111	40	µg/L	05-Jul-17	EPA200.8

ReportDate: Wednesday, July 05, 2017
Print Date: *Friday, July 07, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170390

- CERTIFICATE OF ANALYSIS -

Client Sample ID: NaClO **Taiga Sample ID:** 002

*** 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 05, 2017

Print Date: *Friday, July 07, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- FINAL REPORT -

Prepared For: Government of Nunavut

Address: Community and Government Services
P.O. Box 200
Cambridge Bay,NU
X0B 0C0

Attn: **Mustafa Azmal** **Facsimile:**

Final report has been reviewed and approved by:

Judy Mah
Client Service 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) to ISO/IEC 17025 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: Thursday, June 22, 2017
Print Date: ***Thursday, June 22, 2017***

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- CERTIFICATE OF ANALYSIS -

Client Sample ID: IPH-01 **Taiga Sample ID:** 001

Client Project: 11-4000/CT13-3012
Sample Type: Raw Water
Received Date: 31-May-17
Sampling Date: 30-May-17
Sampling Time:
Location:
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Ammonia as Nitrogen	0.248	0.005	mg/L	31-May-17	SM4500-NH3:G	
Organic Carbon, Dissolved	7.4	0.5	mg/L	05-Jun-17	SM5310:B	
Organic Carbon, Total	7.5	0.5	mg/L	05-Jun-17	SM5310:B	
Phosphorous, Total	0.007	0.002	mg/L	06-Jun-17	SM4500-P:D	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	206	0.4	mg/L	01-Jun-17	SM2320:B	
Colour, Apparent	14	5	CU	01-Jun-17	SM2120:B	
Conductivity, Specific (@25C)	707	0.4	µS/cm	01-Jun-17	SM2510:B	
pH	7.28		pH units	01-Jun-17	SM4500-H:B	
Solids, Total Dissolved	369	10	mg/L	02-Jun-17	SM2540:C	
Solids, Total Suspended	< 3	3	mg/L	02-Jun-17	SM2540:D	
Turbidity	1.02	0.05	NTU	31-May-17	SM2130:B	
Major Ions						
Calcium	48.4	0.1	mg/L	02-Jun-17	SM4110:B	
Chloride	90.5	0.7	mg/L	02-Jun-17	SM4110:B	

ReportDate: Thursday, June 22, 2017
Print Date: ***Thursday, June 22, 2017***

Taiga Environmental Laboratory
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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- CERTIFICATE OF ANALYSIS -

Client Sample ID: IPH-01 **Taiga Sample ID:** 001

Fluoride	0.2	0.1	mg/L	02-Jun-17	SM4110:B	
Hardness	261	0.7	mg/L	02-Jun-17	SM4110:B	
Magnesium	34.1	0.1	mg/L	02-Jun-17	SM4110:B	
Nitrate as Nitrogen	0.40	0.01	mg/L	02-Jun-17	SM4110:B	
Nitrate+Nitrite as Nitrogen	0.40	0.01	mg/L	02-Jun-17	SM4110:B	
Potassium	3.2	0.1	mg/L	02-Jun-17	SM4110:B	
Sodium	46.3	0.1	mg/L	02-Jun-17	SM4110:B	
Sulphate	30	1	mg/L	02-Jun-17	SM4110:B	
Microbiology						
Coliforms, Total	< 1.0	1.0	MPN/100ml	31-May-17	SM9223:B	88
Escherichia coli	< 1.0	1.0	MPN/100ml	31-May-17	SM9223:B	88
Organics						
Oil and Grease, visible	Non-visible			02-Jun-17	Visual Exam	
Subcontracted Organics						
Cyanide, Weak Acid Dissociable	< 0.0010	0.001	mg/L	12-Jun-17	APHA4500-CN	
Phenols, Total	0.0044	0.001	mg/L	16-Jun-17	AB ENV.06537	
Trace Metals, Total						
Aluminum	0.8	0.6	µg/L	07-Jun-17	EPA200.8	
Arsenic	0.6	0.2	µg/L	07-Jun-17	EPA200.8	
Barium	73.6	0.1	µg/L	07-Jun-17	EPA200.8	
Cadmium	< 0.05	0.05	µg/L	07-Jun-17	EPA200.8	
Chromium	< 0.1	0.1	µg/L	07-Jun-17	EPA200.8	
Cobalt	< 0.1	0.1	µg/L	07-Jun-17	EPA200.8	
Copper	0.4	0.2	µg/L	07-Jun-17	EPA200.8	
Iron	147	5	µg/L	07-Jun-17	EPA200.8	

ReportDate: Thursday, June 22, 2017
Print Date: *Thursday, June 22, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- CERTIFICATE OF ANALYSIS -

Client Sample ID: IPH-01 **Taiga Sample ID:** 001

Lead	< 0.1	0.1	µg/L	07-Jun-17	EPA200.8
Manganese	148	0.1	µg/L	07-Jun-17	EPA200.8
Mercury	0.03	0.01	µg/L	07-Jun-17	EPA200.8
Nickel	0.5	0.1	µg/L	07-Jun-17	EPA200.8
Selenium	< 0.3	0.3	µg/L	07-Jun-17	EPA200.8
Silver	< 0.1	0.1	µg/L	07-Jun-17	EPA200.8
Zinc	15.6	0.4	µg/L	07-Jun-17	EPA200.8

ReportDate: Thursday, June 22, 2017
Print Date: *Thursday, June 22, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP-01 **Taiga Sample ID:** 002

Client Project: 11-4000/CT13-3012
Sample Type: Treated Water (Post Filters)
Received Date: 31-May-17
Sampling Date: 30-May-17
Sampling Time:
Location: Cambridge Bay
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Ammonia as Nitrogen	0.284	0.005	mg/L	31-May-17	SM4500-NH3:G	
Organic Carbon, Dissolved	7.2	0.5	mg/L	05-Jun-17	SM5310:B	
Organic Carbon, Total	7.8	0.5	mg/L	05-Jun-17	SM5310:B	
Phosphorous, Total	0.005	0.002	mg/L	06-Jun-17	SM4500-P:D	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	206	0.4	mg/L	01-Jun-17	SM2320:B	
Colour, Apparent	11	5	CU	01-Jun-17	SM2120:B	
Conductivity, Specific (@25C)	718	0.4	µS/cm	01-Jun-17	SM2510:B	
pH	7.40		pH units	01-Jun-17	SM4500-H:B	
Solids, Total Dissolved	359	10	mg/L	02-Jun-17	SM2540:C	
Solids, Total Suspended	4	3	mg/L	02-Jun-17	SM2540:D	
Turbidity	1.09	0.05	NTU	31-May-17	SM2130:B	
Major Ions						
Calcium	47.9	0.1	mg/L	02-Jun-17	SM4110:B	
Chloride	93.0	0.7	mg/L	02-Jun-17	SM4110:B	
Fluoride	0.2	0.1	mg/L	02-Jun-17	SM4110:B	

ReportDate: Thursday, June 22, 2017
Print Date: ***Thursday, June 22, 2017***

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP-01 **Taiga Sample ID:** 002

Hardness	260	0.7	mg/L	02-Jun-17	SM4110:B	
Magnesium	34.0	0.1	mg/L	02-Jun-17	SM4110:B	
Nitrate as Nitrogen	0.20	0.01	mg/L	02-Jun-17	SM4110:B	
Nitrate+Nitrite as Nitrogen	0.20	0.01	mg/L	02-Jun-17	SM4110:B	
Potassium	3.6	0.1	mg/L	02-Jun-17	SM4110:B	
Sodium	48.7	0.1	mg/L	02-Jun-17	SM4110:B	
Sulphate	29	1	mg/L	02-Jun-17	SM4110:B	
Microbiology						
Coliforms, Total	< 1.0	1.0	MPN/100ml	31-May-17	SM9223:B	88
Escherichia coli	< 1.0	1.0	MPN/100ml	31-May-17	SM9223:B	88
Organics						
Bromodichloromethane	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Bromoform	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Chloroform	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Dibromochloromethane	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Oil and Grease, visible	Non-visible			02-Jun-17	Visual Exam	
Trihalomethanes, Total	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Subcontracted Organics						
Cyanide, Weak Acid Dissociable	0.0011	0.001	mg/L	12-Jun-17	APHA4500-CN	
Phenols, Total	0.0032	0.001	mg/L	16-Jun-17	AB ENV.06537	
Trace Metals, Total						
Aluminum	0.8	0.6	µg/L	07-Jun-17	EPA200.8	
Arsenic	0.6	0.2	µg/L	07-Jun-17	EPA200.8	
Barium	66.4	0.1	µg/L	07-Jun-17	EPA200.8	
Cadmium	< 0.05	0.05	µg/L	07-Jun-17	EPA200.8	

ReportDate: Thursday, June 22, 2017
Print Date: *Thursday, June 22, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP-01 **Taiga Sample ID:** 002

Chromium	< 0.1	0.1	µg/L	07-Jun-17	EPA200.8
Cobalt	< 0.1	0.1	µg/L	07-Jun-17	EPA200.8
Copper	11.7	0.2	µg/L	07-Jun-17	EPA200.8
Iron	86	5	µg/L	07-Jun-17	EPA200.8
Lead	1.0	0.1	µg/L	07-Jun-17	EPA200.8
Manganese	156	0.1	µg/L	07-Jun-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	07-Jun-17	EPA200.8
Nickel	0.2	0.1	µg/L	07-Jun-17	EPA200.8
Selenium	< 0.3	0.3	µg/L	07-Jun-17	EPA200.8
Silver	< 0.1	0.1	µg/L	07-Jun-17	EPA200.8
Zinc	38.3	0.4	µg/L	07-Jun-17	EPA200.8

ReportDate: Thursday, June 22, 2017
Print Date: *Thursday, June 22, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP-02 **Taiga Sample ID:** 003

Client Project: 11-4000/CT13-3012
Sample Type: Treated Water (Post Storage Tank)
Received Date: 31-May-17
Sampling Date: 30-May-17
Sampling Time:
Location: Cambridge Bay
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Ammonia as Nitrogen	0.242	0.005	mg/L	31-May-17	SM4500-NH3:G	
Organic Carbon, Dissolved	7.5	0.5	mg/L	05-Jun-17	SM5310:B	
Organic Carbon, Total	7.6	0.5	mg/L	05-Jun-17	SM5310:B	
Phosphorous, Total	0.005	0.002	mg/L	06-Jun-17	SM4500-P:D	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	209	0.4	mg/L	01-Jun-17	SM2320:B	
Colour, Apparent	11	5	CU	01-Jun-17	SM2120:B	
Conductivity, Specific (@25C)	734	0.4	µS/cm	01-Jun-17	SM2510:B	
pH	7.40		pH units	01-Jun-17	SM4500-H:B	
Solids, Total Dissolved	397	10	mg/L	02-Jun-17	SM2540:C	
Solids, Total Suspended	< 3	3	mg/L	02-Jun-17	SM2540:D	
Turbidity	1.34	0.05	NTU	31-May-17	SM2130:B	
Major Ions						
Calcium	48.3	0.1	mg/L	02-Jun-17	SM4110:B	
Chloride	96.9	0.7	mg/L	02-Jun-17	SM4110:B	
Fluoride	0.2	0.1	mg/L	02-Jun-17	SM4110:B	

ReportDate: Thursday, June 22, 2017
Print Date: ***Thursday, June 22, 2017***

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP-02 **Taiga Sample ID:** 003

Hardness	262	0.7	mg/L	02-Jun-17	SM4110:B	
Magnesium	34.3	0.1	mg/L	02-Jun-17	SM4110:B	
Nitrate as Nitrogen	0.22	0.01	mg/L	02-Jun-17	SM4110:B	
Nitrate+Nitrite as Nitrogen	0.22	0.01	mg/L	02-Jun-17	SM4110:B	
Potassium	3.3	0.1	mg/L	02-Jun-17	SM4110:B	
Sodium	51.1	0.1	mg/L	02-Jun-17	SM4110:B	
Sulphate	29	1	mg/L	02-Jun-17	SM4110:B	
Microbiology						
Coliforms, Total	< 1.0	1.0	MPN/100ml	31-May-17	SM9223:B	88
Escherichia coli	< 1.0	1.0	MPN/100ml	31-May-17	SM9223:B	88
Organics						
Bromodichloromethane	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Bromoform	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Chloroform	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Dibromochloromethane	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Oil and Grease, visible	Non-visible			02-Jun-17	Visual Exam	
Trihalomethanes, Total	0.006	0.005	mg/L	06-Jun-17	EPA8260B	
Subcontracted Organics						
Cyanide, Weak Acid Dissociable	< 0.0010	0.001	mg/L	12-Jun-17	APHA4500-CN	
Phenols, Total	0.0028	0.001	mg/L	16-Jun-17	AB ENV.06537	
Trace Metals, Total						
Aluminum	1.0	0.6	µg/L	07-Jun-17	EPA200.8	
Arsenic	0.6	0.2	µg/L	07-Jun-17	EPA200.8	
Barium	68.1	0.1	µg/L	07-Jun-17	EPA200.8	
Cadmium	< 0.05	0.05	µg/L	07-Jun-17	EPA200.8	

ReportDate: Thursday, June 22, 2017
Print Date: *Thursday, June 22, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- CERTIFICATE OF ANALYSIS -

Client Sample ID: WTP-02 **Taiga Sample ID:** 003

Chromium	< 0.1	0.1	µg/L	07-Jun-17	EPA200.8
Cobalt	< 0.1	0.1	µg/L	07-Jun-17	EPA200.8
Copper	27.1	0.2	µg/L	07-Jun-17	EPA200.8
Iron	128	5	µg/L	07-Jun-17	EPA200.8
Lead	1.1	0.1	µg/L	07-Jun-17	EPA200.8
Manganese	218	0.1	µg/L	07-Jun-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	07-Jun-17	EPA200.8
Nickel	0.3	0.1	µg/L	07-Jun-17	EPA200.8
Selenium	< 0.3	0.3	µg/L	07-Jun-17	EPA200.8
Silver	< 0.1	0.1	µg/L	07-Jun-17	EPA200.8
Zinc	197	0.4	µg/L	07-Jun-17	EPA200.8

ReportDate: Thursday, June 22, 2017
Print Date: *Thursday, June 22, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- CERTIFICATE OF ANALYSIS -

Client Sample ID: HV-01 **Taiga Sample ID:** 004

Client Project: 11-4000/CT13-3012
Sample Type: Treated Water (at Truck Hose)
Received Date: 31-May-17
Sampling Date: 30-May-17
Sampling Time:
Location: Cambridge Bay
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Ammonia as Nitrogen	0.249	0.005	mg/L	31-May-17	SM4500-NH3:G	
Organic Carbon, Dissolved	7.5	0.5	mg/L	05-Jun-17	SM5310:B	
Organic Carbon, Total	7.4	0.5	mg/L	05-Jun-17	SM5310:B	
Phosphorous, Total	0.003	0.002	mg/L	06-Jun-17	SM4500-P:D	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	209	0.4	mg/L	01-Jun-17	SM2320:B	
Colour, Apparent	12	5	CU	01-Jun-17	SM2120:B	
Conductivity, Specific (@25C)	737	0.4	µS/cm	01-Jun-17	SM2510:B	
pH	7.63		pH units	01-Jun-17	SM4500-H:B	
Solids, Total Dissolved	372	10	mg/L	02-Jun-17	SM2540:C	
Solids, Total Suspended	< 3	3	mg/L	02-Jun-17	SM2540:D	
Turbidity	0.95	0.05	NTU	31-May-17	SM2130:B	
Major Ions						
Calcium	48.3	0.1	mg/L	02-Jun-17	SM4110:B	
Chloride	97.1	0.7	mg/L	02-Jun-17	SM4110:B	
Fluoride	0.2	0.1	mg/L	02-Jun-17	SM4110:B	

ReportDate: Thursday, June 22, 2017
Print Date: ***Thursday, June 22, 2017***

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- CERTIFICATE OF ANALYSIS -

Client Sample ID: HV-01 **Taiga Sample ID:** 004

Hardness	262	0.7	mg/L	02-Jun-17	SM4110:B	
Magnesium	34.3	0.1	mg/L	02-Jun-17	SM4110:B	
Nitrate as Nitrogen	0.22	0.01	mg/L	02-Jun-17	SM4110:B	
Nitrate+Nitrite as Nitrogen	0.30	0.01	mg/L	02-Jun-17	SM4110:B	
Potassium	3.3	0.1	mg/L	02-Jun-17	SM4110:B	
Sodium	51.1	0.1	mg/L	02-Jun-17	SM4110:B	
Sulphate	29	1	mg/L	02-Jun-17	SM4110:B	
Microbiology						
Coliforms, Total	< 1.0	1.0	MPN/100ml	31-May-17	SM9223:B	88
Escherichia coli	< 1.0	1.0	MPN/100ml	31-May-17	SM9223:B	88
Organics						
Bromodichloromethane	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Bromoform	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Chloroform	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Dibromochloromethane	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Oil and Grease, visible	Non-visible			02-Jun-17	Visual Exam	
Trihalomethanes, Total	0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Subcontracted Organics						
Cyanide, Weak Acid Dissociable	< 0.0010	0.001	mg/L	12-Jun-17	APHA4500-CN	
Phenols, Total	0.0029	0.001	mg/L	16-Jun-17	AB ENV.06537	
Trace Metals, Total						
Aluminum	28.5	0.6	µg/L	07-Jun-17	EPA200.8	
Arsenic	0.6	0.2	µg/L	07-Jun-17	EPA200.8	
Barium	68.1	0.1	µg/L	07-Jun-17	EPA200.8	
Cadmium	< 0.05	0.05	µg/L	07-Jun-17	EPA200.8	

ReportDate: Thursday, June 22, 2017
Print Date: *Thursday, June 22, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- CERTIFICATE OF ANALYSIS -

Client Sample ID: HV-01 **Taiga Sample ID:** 004

Chromium	< 0.1	0.1	µg/L	07-Jun-17	EPA200.8
Cobalt	< 0.1	0.1	µg/L	07-Jun-17	EPA200.8
Copper	11.8	0.2	µg/L	07-Jun-17	EPA200.8
Iron	130	5	µg/L	07-Jun-17	EPA200.8
Lead	0.5	0.1	µg/L	07-Jun-17	EPA200.8
Manganese	217	0.1	µg/L	07-Jun-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	07-Jun-17	EPA200.8
Nickel	0.3	0.1	µg/L	07-Jun-17	EPA200.8
Selenium	< 0.3	0.3	µg/L	07-Jun-17	EPA200.8
Silver	< 0.1	0.1	µg/L	07-Jun-17	EPA200.8
Zinc	205	0.4	µg/L	07-Jun-17	EPA200.8

ReportDate: Thursday, June 22, 2017
Print Date: *Thursday, June 22, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- CERTIFICATE OF ANALYSIS -

Client Sample ID: KHS-01 **Taiga Sample ID:** 005

Client Project: 11-4000/CT13-3012
Sample Type: Treated Water (at High School)
Received Date: 31-May-17
Sampling Date: 30-May-17
Sampling Time:
Location: Cambridge Bay
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Ammonia as Nitrogen	0.246	0.005	mg/L	31-May-17	SM4500-NH3:G	
Organic Carbon, Dissolved	7.6	0.5	mg/L	05-Jun-17	SM5310:B	
Organic Carbon, Total	7.6	0.5	mg/L	05-Jun-17	SM5310:B	
Phosphorous, Total	0.005	0.002	mg/L	06-Jun-17	SM4500-P:D	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	211	0.4	mg/L	01-Jun-17	SM2320:B	
Colour, Apparent	17	5	CU	01-Jun-17	SM2120:B	
Conductivity, Specific (@25C)	743	0.4	µS/cm	01-Jun-17	SM2510:B	
pH	7.53		pH units	01-Jun-17	SM4500-H:B	
Solids, Total Dissolved	366	10	mg/L	02-Jun-17	SM2540:C	
Solids, Total Suspended	< 3	3	mg/L	02-Jun-17	SM2540:D	
Turbidity	1.07	0.05	NTU	31-May-17	SM2130:B	
Major Ions						
Calcium	48.2	0.1	mg/L	02-Jun-17	SM4110:B	
Chloride	97.6	0.7	mg/L	02-Jun-17	SM4110:B	
Fluoride	0.2	0.1	mg/L	02-Jun-17	SM4110:B	

ReportDate: Thursday, June 22, 2017
Print Date: ***Thursday, June 22, 2017***

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- CERTIFICATE OF ANALYSIS -

Client Sample ID: KHS-01 **Taiga Sample ID:** 005

Hardness	261	0.7	mg/L	02-Jun-17	SM4110:B	
Magnesium	34.2	0.1	mg/L	02-Jun-17	SM4110:B	
Nitrate as Nitrogen	0.21	0.01	mg/L	02-Jun-17	SM4110:B	
Nitrate+Nitrite as Nitrogen	0.21	0.01	mg/L	02-Jun-17	SM4110:B	
Potassium	3.3	0.1	mg/L	02-Jun-17	SM4110:B	
Sodium	51.3	0.1	mg/L	02-Jun-17	SM4110:B	
Sulphate	29	1	mg/L	02-Jun-17	SM4110:B	
Microbiology						
Coliforms, Total	< 1.0	1.0	MPN/100ml	31-May-17	SM9223:B	88
Escherichia coli	< 1.0	1.0	MPN/100ml	31-May-17	SM9223:B	88
Organics						
Bromodichloromethane	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Bromoform	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Chloroform	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Dibromochloromethane	< 0.005	0.005	mg/L	06-Jun-17	EPA8260B	
Oil and Grease, visible	Non-visible			02-Jun-17	Visual Exam	
Trihalomethanes, Total	0.006	0.005	mg/L	06-Jun-17	EPA8260B	
Subcontracted Organics						
Cyanide, Weak Acid Dissociable	< 0.0010	0.001	mg/L	12-Jun-17	APHA4500-CN	
Phenols, Total	0.0037	0.001	mg/L	16-Jun-17	AB ENV.06537	
Trace Metals, Total						
Aluminum	1.1	0.6	µg/L	07-Jun-17	EPA200.8	
Arsenic	0.6	0.2	µg/L	07-Jun-17	EPA200.8	
Barium	65.3	0.1	µg/L	07-Jun-17	EPA200.8	
Cadmium	< 0.05	0.05	µg/L	07-Jun-17	EPA200.8	

ReportDate: Thursday, June 22, 2017
Print Date: *Thursday, June 22, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- CERTIFICATE OF ANALYSIS -

Client Sample ID: KHS-01 **Taiga Sample ID:** 005

Chromium	< 0.1	0.1	µg/L	07-Jun-17	EPA200.8
Cobalt	0.1	0.1	µg/L	07-Jun-17	EPA200.8
Copper	976	0.2	µg/L	07-Jun-17	EPA200.8
Iron	163	5	µg/L	07-Jun-17	EPA200.8
Lead	0.6	0.1	µg/L	07-Jun-17	EPA200.8
Manganese	277	0.1	µg/L	07-Jun-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	07-Jun-17	EPA200.8
Nickel	0.5	0.1	µg/L	07-Jun-17	EPA200.8
Selenium	< 0.3	0.3	µg/L	07-Jun-17	EPA200.8
Silver	< 0.1	0.1	µg/L	07-Jun-17	EPA200.8
Zinc	428	0.4	µg/L	07-Jun-17	EPA200.8

ReportDate: Thursday, June 22, 2017
Print Date: *Thursday, June 22, 2017*

Taiga Environmental Laboratory
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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170306

- CERTIFICATE OF ANALYSIS -

Client Sample ID: KHS-01 **Taiga Sample ID:** 005

- DATA QUALIFERS -

Data Qualifier Descriptions:

88 *Samples analysed past holding time, as per client request.*

*** 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

Appendix: B

Effluent Test Results 2017

Water Licence: 3BM-CAM 1520

Hamlet of Cambridge Bay, NU

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170568

- PRELIMINARY REPORT -

Prepared For: Hamlet of Cambridge Bay

Address: P.O. Box 16
Cambridge Bay,NU
X0B 0C0

Attn: **Wayne Weese** **Facsimile: (867) 983-2186**

Final report has been reviewed and approved by:

Judy Mah
Client Service 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) to ISO/IEC 17025 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:
Print Date: *Wednesday, July 26, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170568

- CERTIFICATE OF ANALYSIS -

Client Sample ID: CAM-3 **Taiga Sample ID:** 001

Client Project: Cambridge Bay Sewage and Solid Waste
Sample Type: Sewage Lagoon
Received Date: 19-Jul-17
Sampling Date: 18-Jul-17
Sampling Time: 10:00

Location: Sewage Lagoon, Wetland, Solid Waste

Report Status: **Preliminary**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Ammonia as Nitrogen		0.005	mg/L		SM4500-NH3:G	
Biochemical Oxygen Demand		2	mg/L		SM5210:B	
CBOD		2	mg/L		SM5210:B	
Organic Carbon, Dissolved		0.5	mg/L		SM5310:B	
Organic Carbon, Total		0.5	mg/L		SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	483	0.4	mg/L	20-Jul-17	SM2320:B	
Conductivity, Specific (@25C)	3920	0.4	µS/cm	20-Jul-17	SM2510:B	
pH	7.80		pH units	20-Jul-17	SM4500-H:B	
Solids, Total Dissolved	3130	10	mg/L	21-Jul-17	SM2540:C	
Solids, Total Suspended	97	3	mg/L	21-Jul-17	SM2540:D	
Turbidity	168	0.05	NTU	19-Jul-17	SM2130:B	
Major Ions						
Calcium		0.1	mg/L		SM4110:B	

ReportDate:
Print Date: *Wednesday, July 26, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170568

- CERTIFICATE OF ANALYSIS -

Client Sample ID: CAM-3 **Taiga Sample ID:** 001

Chloride		0.7	mg/L		SM4110:B
Hardness		0.7	mg/L		SM4110:B
Magnesium		0.1	mg/L		SM4110:B
Nitrate as Nitrogen		0.01	mg/L		SM4110:B
Nitrite as Nitrogen		0.01	mg/L		SM4110:B
Potassium		0.1	mg/L		SM4110:B
Sodium		0.1	mg/L		SM4110:B
Sulphate		1	mg/L		SM4110:B
Microbiology					
Coliforms, Fecal		1	CFU/100mL		SM9222:D
Organics					
Hexane Extractable Material		2.0	mg/L		EPA1664A
Subcontracted Organics					
Phenols, Total		0.001	mg/L		AB ENV.06537
Trace Metals, Total					
Aluminum	54.7	5	µg/L	21-Jul-17	EPA200.8
Arsenic	5.3	0.2	µg/L	21-Jul-17	EPA200.8
Barium	28.0	0.1	µg/L	21-Jul-17	EPA200.8
Cadmium	< 0.1	0.1	µg/L	21-Jul-17	EPA200.8
Chromium	1.9	0.1	µg/L	21-Jul-17	EPA200.8
Cobalt	2.7	0.1	µg/L	21-Jul-17	EPA200.8
Iron	13700	5	µg/L	21-Jul-17	EPA200.8
Lead	5.4	0.1	µg/L	21-Jul-17	EPA200.8
Manganese	393	0.1	µg/L	21-Jul-17	EPA200.8
Mercury	0.02	0.01	µg/L	21-Jul-17	EPA200.8

ReportDate:
Print Date: *Wednesday, July 26, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170568

- CERTIFICATE OF ANALYSIS -

Client Sample ID: CAM-3 **Taiga Sample ID:** 001

Nickel	23.8	0.1	µg/L	21-Jul-17	EPA200.8
Zinc	133	5	µg/L	21-Jul-17	EPA200.8

ReportDate:
Print Date: *Wednesday, July 26, 2017*

Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 170568

- CERTIFICATE OF ANALYSIS -

Client Sample ID: CAM-4 **Taiga Sample ID:** 002

Client Project: Cambridge Bay Sewage and Solid Waste
Sample Type: Solid Waste
Received Date: 19-Jul-17
Sampling Date: 18-Jul-17
Sampling Time:
Location: Sewage Lagoon, Wetland, Solid Waste
Report Status: **Preliminary**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Biochemical Oxygen Demand		2	mg/L		SM5210:B	
CBOD		2	mg/L		SM5210:B	
Organic Carbon, Dissolved		0.5	mg/L		SM5310:B	
Organic Carbon, Total		0.5	mg/L		SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	252	0.4	mg/L	20-Jul-17	SM2320:B	
Conductivity, Specific (@25C)	863	0.4	µS/cm	20-Jul-17	SM2510:B	
pH	8.62		pH units	20-Jul-17	SM4500-H:B	
Solids, Total Dissolved	470	10	mg/L	21-Jul-17	SM2540:C	
Solids, Total Suspended	91	3	mg/L	21-Jul-17	SM2540:D	
Turbidity	23.0	0.05	NTU	19-Jul-17	SM2130:B	
Major Ions						
Calcium		0.1	mg/L		SM4110:B	
Chloride		0.7	mg/L		SM4110:B	
Hardness		0.7	mg/L		SM4110:B	
Magnesium		0.1	mg/L		SM4110:B	

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Taiga Batch No.: 170568

- CERTIFICATE OF ANALYSIS -

Client Sample ID: CAM-4 **Taiga Sample ID:** 002

Nitrate as Nitrogen		0.01	mg/L		SM4110:B
Nitrite as Nitrogen		0.01	mg/L		SM4110:B
Potassium		0.1	mg/L		SM4110:B
Sodium		0.1	mg/L		SM4110:B
Sulphate		1	mg/L		SM4110:B
Microbiology					
Coliforms, Fecal		1	CFU/100mL		SM9222:D
Organics					
Hexane Extractable Material		2.0	mg/L		EPA1664A
Subcontracted Organics					
Phenols, Total		0.001	mg/L		AB ENV.06537
Trace Metals, Total					
Aluminum	28.2	5	µg/L	21-Jul-17	EPA200.8
Arsenic	1.4	0.2	µg/L	21-Jul-17	EPA200.8
Barium	13.0	0.1	µg/L	21-Jul-17	EPA200.8
Cadmium	< 0.1	0.1	µg/L	21-Jul-17	EPA200.8
Chromium	0.2	0.1	µg/L	21-Jul-17	EPA200.8
Cobalt	0.4	0.1	µg/L	21-Jul-17	EPA200.8
Iron	322	5	µg/L	21-Jul-17	EPA200.8
Lead	< 0.1	0.1	µg/L	21-Jul-17	EPA200.8
Manganese	53.0	0.1	µg/L	21-Jul-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	21-Jul-17	EPA200.8
Nickel	2.0	0.1	µg/L	21-Jul-17	EPA200.8
Zinc	12.6	5	µg/L	21-Jul-17	EPA200.8

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Taiga Batch No.: 170568

- CERTIFICATE OF ANALYSIS -

Client Sample ID: CAM-5 **Taiga Sample ID:** 003

Client Project: Cambridge Bay Sewage and Solid Waste
Sample Type: Wetland Cell
Received Date: 19-Jul-17
Sampling Date: 18-Jul-17
Sampling Time: 10:30
Location: Sewage Lagoon, Wetland, Solid Waste
Report Status: **Preliminary**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Biochemical Oxygen Demand		2	mg/L		SM5210:B	
CBOD		2	mg/L		SM5210:B	
Organic Carbon, Dissolved		0.5	mg/L		SM5310:B	
Organic Carbon, Total		0.5	mg/L		SM5310:B	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	236	0.4	mg/L	20-Jul-17	SM2320:B	
Conductivity, Specific (@25C)	949	0.4	µS/cm	20-Jul-17	SM2510:B	
pH	9.29		pH units	20-Jul-17	SM4500-H:B	
Solids, Total Dissolved	581	10	mg/L	21-Jul-17	SM2540:C	
Solids, Total Suspended	71	3	mg/L	21-Jul-17	SM2540:D	
Turbidity	19.6	0.05	NTU	19-Jul-17	SM2130:B	
Major Ions						
Calcium		0.1	mg/L		SM4110:B	
Chloride		0.7	mg/L		SM4110:B	
Hardness		0.7	mg/L		SM4110:B	
Magnesium		0.1	mg/L		SM4110:B	

ReportDate:
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Taiga Batch No.: 170568

- CERTIFICATE OF ANALYSIS -

Client Sample ID: CAM-5 **Taiga Sample ID:** 003

Nitrate as Nitrogen		0.01	mg/L		SM4110:B
Nitrite as Nitrogen		0.01	mg/L		SM4110:B
Potassium		0.1	mg/L		SM4110:B
Sodium		0.1	mg/L		SM4110:B
Sulphate		1	mg/L		SM4110:B
Microbiology					
Coliforms, Fecal		1	CFU/100mL		SM9222:D
Organics					
Hexane Extractable Material		2.0	mg/L		EPA1664A
Subcontracted Organics					
Phenols, Total		0.001	mg/L		AB ENV.06537
Trace Metals, Total					
Aluminum	55.2	5	µg/L	21-Jul-17	EPA200.8
Arsenic	3.9	0.2	µg/L	21-Jul-17	EPA200.8
Barium	36.2	0.1	µg/L	21-Jul-17	EPA200.8
Cadmium	< 0.1	0.1	µg/L	21-Jul-17	EPA200.8
Chromium	0.3	0.1	µg/L	21-Jul-17	EPA200.8
Cobalt	0.4	0.1	µg/L	21-Jul-17	EPA200.8
Iron	250	5	µg/L	21-Jul-17	EPA200.8
Lead	0.7	0.1	µg/L	21-Jul-17	EPA200.8
Manganese	21.4	0.1	µg/L	21-Jul-17	EPA200.8
Mercury	< 0.01	0.01	µg/L	21-Jul-17	EPA200.8
Nickel	3.5	0.1	µg/L	21-Jul-17	EPA200.8
Zinc	6.2	5	µg/L	21-Jul-17	EPA200.8

ReportDate:
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Taiga Batch No.: 170568

- CERTIFICATE OF ANALYSIS -

Client Sample ID: CAM-5 **Taiga Sample ID:** 003

*** 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:

Print Date: *Wednesday, July 26, 2017*

Appendix: C

Pages from Water Licence Part B-H

Water Licence: 3BM-CAM 1520

Hamlet of Cambridge Bay, NU

PART B: GENERAL CONDITIONS

1. The Licensee shall file an Annual Report on the Appurtenant Undertaking with the Board no later than March 31 of the year following the calendar year being reported, containing the following information:

    a. tabular summaries of all data generated under the "Monitoring Program";
    b. the monthly and annual quantities in cubic metres of fresh Water obtained at the Modified Water Supply Facility and/or for all purposes under the licence;
    c. the monthly and annual quantities in cubic metres of all Waste discharged;
    d. a summary of any open burning undertaken under Part D, Item 10, including quantity and details of the waste being burned, along with photographic evidence of site cleanup;
    e. a summary of modifications and/or major maintenance work carried out on the Water Supply Facility and Waste Disposal Facilities, including all associated structure;
    f. a list of unauthorized discharges and summary of follow-up action taken;
    g. a summary of any abandonment and restoration work completed during the year and an outline of any work anticipated for the next year;
    h. Any Addendum with updates or revisions for manuals and plans (including *Operations and Maintenance Manuals/Plans*) as required by changes in operation and/or technology;
    i. a summary of any studies or reports requested by the Board that relate to the use of Water and Waste disposal or restoration, and a brief description of any future studies planned; and
    j. any other details on Water or Waste deposit requested by the Board by November 1 of the year being reported;

2. The Licensee shall comply with the "Monitoring Program" described in this Licence, and any amendments to the "Monitoring Program" as may be made from time to time, pursuant to the conditions of this Licence.

3. The "Monitoring Program" and compliance dates specified in the Licence may be modified at the discretion of the Board in writing.

4. The Licensee shall notify the NWB of any changes in operating plans or conditions associated with this project at least thirty (30) days prior to any such change.

5. The Licensee shall install flow meters or other such devices, or implement other such methods as approved by the Board in writing, for the measuring of water volumes as required under Part H.

6. The Licensee shall, for all Plans submitted under this Licence, include a proposed timetable for implementation. Plans submitted, cannot be undertaken without subsequent written Board approval and direction. The Board may alter or modify a Plan if necessary to achieve the legislative objectives and will notify the Licensee in writing of acceptance, rejection or alteration of the Plan.

7. The Licensee shall, for all Plans submitted under this Licence, implement the Plan as approved by the Board in writing.

8. The Licensee shall review the Plans referred to in this Licence, as required by changes in operation and/or technology, and modify the Plan accordingly. Revisions to the Plans shall be submitted in the form of an Addendum to be included with the Annual Report.

9. Every Plan to be carried out pursuant to the terms and conditions of this Licence shall become a part of this Licence, and any additional terms and condition imposed upon approval of a Plan by the Board become part of this Licence. All terms and conditions of the Licence should be contemplated in the development of a Plan where appropriate.

10. The Licensee shall, within ninety (90) days following the first visit by the Inspector, following issuance of this Licence, post the necessary signs to identify the stations of the "Monitoring Program," in the Official Languages of Nunavut.

11. The Licensee shall ensure a copy of this Licence is maintained at the Municipal Office at all times. Any communication with respect to this Licence and any notice provided to an Inspector, shall be made in writing to the attention of:

(a) Manager of Licensing:
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0
Telephone: (867) 360-6338
Fax: (867) 360-6369
Email: licensing@nwb-oen.ca

(b) Inspector Contact:
Manager of Field Operations, AANDC
Nunavut District, Nunavut Region
P.O. Box 100
Iqaluit, NU X0A 0H0
Telephone: (867) 975-4295
Fax: (867) 979-6445

12. The Licensee shall submit one paper copy and one electronic copy of all reports, studies, and plans to the Board. Reports or studies submitted to the Board by the Licensee shall include a detailed executive summary in Inuktitut and Inuinnaqtun.

13. The Licensee shall ensure that all document(s) and correspondence submitted by the Licensee to the Board are received and acknowledged by the Manager of Licensing.

14. This Licence is not assignable except as provided in Section 44 of the Act.

PART C: CONDITIONS APPLYING TO WATER USE

1. The Licensee shall obtain all fresh water processed by the Modified Water Supply Facility and for all purposes under this Licence from Water Lake.

2. The annual quantity of Water used for all purposes shall not exceed eighty-six thousand two hundred (86,200) cubic metres, at a maximum daily withdrawal rate that shall not exceed two hundred and thirty-six (236) cubic metres.

3. The Licensee shall equip all water intake hoses with a screen of an appropriate mesh size to ensure that fish are not entrained and shall withdraw water at a rate such that fish do not become impinged on the screen.

4. The Licensee shall not remove any material from below the ordinary High Water Mark of any water body unless otherwise approved by the Board in writing.

5. The Licensee shall not cause erosion to the banks of any body of water and shall provide necessary controls to prevent such erosion.

6. The Licensee shall implement sediment and erosion control measures, prior to and maintained during the operation to prevent entry of sediment into Water.

7. The Licensee shall submit to the Board for approval in writing, at least thirty (30) days prior to the use of Water in sufficient volume that the source water body may be drawn down, the following information: volume required, hydrological overview of the water body, details of impacts, and proposed mitigation measures.

PART D: CONDITIONS APPLYING TO WASTE DISPOSAL

1. The Licensee shall direct all Sewage generated by its undertaking to the Modified Sewage Disposal Facility included under the scope of this licence.

2. The Licensee shall direct Effluent from the Modified Solid Waste Disposal Facility to the Retention Sewage Lagoon as required.

3. The Licensee shall provide a minimum of ten (10) days' notice to an Inspector of the intent to discharge Effluent from the Modified Sewage Disposal Facility.

4. All Effluent discharged from the Modified Solid Waste Disposal Facility to the Retention Sewage Lagoon, shall be monitored for conditions under Part H, Item 5.

5. All Effluent discharged from the Modified Sewage Disposal Facility to the Sewage Wetland at Monitoring Program Station CAM-5 shall be measured for the parameters listed under this term and condition. Effluent at the outfall area at Monitoring Program Station CAM-6, shall not exceed the following Effluent quality limits:

Parameter	Maximum Concentration of Any Grab Sample
BOD_5	100 mg/L
Total Suspended Solids	120 mg/L
Fecal Coliforms	1 x 10^6 CFU/100mL
Oil and grease	No visible sheen
pH	between 6 and 9

6. The Licensee shall maintain at all times, a freeboard of at least 1.0 metre, or as recommended by a qualified Geotechnical Engineer and as approved by the Board in writing, for all dams, dykes or other structures intended to contain, withhold, divert or retain Water or Waste.

7. The Modified Sewage Disposal Facility shall be maintained and operated in such a manner as to prevent structural failure.

8. The Licensee shall manage all solid Waste generated by its undertaking and/or disposed of at the Modified Solid Waste Disposal Facility in accordance with acceptable standard and practices.

9. The Licensee shall not open burn plastics, wood treated with preservatives, electric wire, Styrofoam, asbestos or painted wood to prevent the deposition of waste materials of incomplete combustion and/or leachate from contaminated ash residual, from impacting any surrounding waters, unless otherwise approved by the Board in writing.

10. The Licensee shall provide a minimum of ten (10) days' notice to an Inspector, of the intent to open-burning municipal waste in accordance with the Government of Nunavut's *Environmental Guideline for the Burning and Incineration of Solid Waste* (Revised 2012), at the designated location at the Modified Solid Waste Disposal Facility, including the details of the types and quantity of waste to be burned, proposed dates, protocols to be followed, ultimate disposal of residual ash and the person responsible for the activity.

11. The Licensee shall segregate and store all hazardous materials and/or hazardous Waste within the Modified Solid Waste Disposal Facility in such a manner as to prevent the deposit of deleterious substances into any Water, until such a time that the materials have been removed for proper disposal at an approved facility.

PART E: CONDITIONS APPLYING TO MODIFICATIONS AND CONSTRUCTION

1. The Licensee shall submit to the Board for approval in writing, for construction design drawings stamped by a qualified Engineer, sixty (60) days prior to the

construction of any dams, dykes or structures intended to contain, withhold, divert or retain Water or Waste.

2. The Licensee may, without written approval from the Board, carry out modifications to the Water Supply Facility and Waste Disposal Facilities provided that such modifications are consistent with the terms of this Licence and the following requirements are met:

   a. the Licensee has notified the Board in writing of such proposed modifications at least sixty (60) days prior to beginning the modifications;

   b. these modifications do not place the Licensee in contravention of the Licence or the Act;

   c. the Board has not, during the sixty (60) days following notification of the proposed modifications, informed the Licensee that review of the proposal will require more than sixty (60) days; and

   d. the Board has not rejected the proposed modifications.

3. Modifications for which all of the conditions referred to in Part E, Item 2, have not been met may be carried out only with written approval from the Board. The Licensee shall provide as-built plans and drawings of the Modifications referred to in this Licence within ninety (90) days of completion of the Modification. These plans and drawings shall be stamped by an Engineer.

4. All activities shall be conducted in such a way as to minimize impacts on surface drainage and the Licensee shall immediately undertake any corrective measures in the event of any impacts on surface drainage.

5. The Licensee shall implement and maintain sediment and erosion control measures prior to and during activities carried out under this Part, to prevent the release of sediment and minimize erosion.

PART F: CONDITIONS APPLYING TO OPERATION AND MAINTENANCE

1. The Board has approved the Plan entitled *Sewage Lagoon Operation and Maintenance Manual*, dated December 2013 that was submitted as additional information with the application.

2. The Board has approved the Plan entitled *Municipal Solid Waste Disposal Facility Operations and maintenance Manual* dated February 2014 that was submitted as additional information with the application.

3. The Board has approved the Plan entitled *Spill Contingency Plan* dated November 2013 that was submitted as additional information with the application.

4. The Plan referred to in Part F, Item 3 shall be updated within sixty (60) days of issuance of this Licence, and submitted to the Board for review, to include or address the following requirements:

    a. NT-NU spill Report form;
    b. Site map showing the location of spills, Water and Waste management facilities; and
    c. Relevant material Safety Data Sheets (MSDS).

5. The Licensee shall submit to the Board for approval, within ninety (90) days of the issuance of this Licence, a stand-alone Modified Water Supply Facility Operation and Maintenance (O&M) Manual that addresses all components of the system and includes a schedule for recording daily Water use volumes requirements in Part H, Items 1 and 2.

6. The Licensee, shall, within ninety (90) days of issuance of this Licence, provide separately or include as part of the Modified Water Supply Facility Operation and Maintenance Manual required Part F, Item 5, as-built drawings for the Water Supply Facility that are signed and stamped by an Engineer, as required by Part E, Item 3.

7. The Licensee shall submit to the Board for approval in writing, at least sixty (60) days prior to conducting any desludging operations, a stand-alone Sewage Sludge Management Plan.

8. The Licensee shall review the Operations and Maintenance (O&M) Plans or Manuals referred to in Part F, Items 1, 2, 3, 5, and 7 as required by changes in operation and/or technology and modify accordingly. Revisions are to be submitted to the Board for approval in writing, in the form of an Addendum, to be included with the Annual Report required under Part B, Item 1.

9. The Licensee shall arrange for inspections to be conducted by an appropriate Engineer, at least once annually, of all structures or facilities designed to contain, withhold, divert or retain Water or Waste, during the summer months (July/August) and/or during periods of flow. An Engineer's report shall be submitted to the Board within sixty (60) days of the date of inspection, including a cover letter from the Licensee outlining an implementation plan to address each of the Engineer's recommendations.

10. An inspection of all engineered facilities shall be conducted, during the summer period (July/August), by a Geotechnical Engineer in accordance with the *Canadian Dam Safety Guidelines*, at least one (1) year prior to expiry of the Licence. The Geotechnical Engineer's report shall be submitted to the Board within sixty (60) days of the inspection, including a cover letter from the Licensee outlining an implementation plan to address each of the Engineer's recommendations.

11. The Licensee shall perform more frequent inspections of the engineered facilities at the request of an Inspector.

12. The Licensee shall, during the term of this Licence, undertake the following activities in addition to any other required action should an unauthorized discharge of waste occur or if such a discharge is foreseeable:

    a. employ the appropriate contingency measures as approved under the Spill Contingency Plan for the Hamlet of Cambridge Bay;
    b. report the incident immediately via the 24-Hour Spill Reporting Line at (867) 920-8130 and to the Inspector at (867) 975-4295; and
    c. submit to the Inspector, a detailed report on each occurrence, not later than thirty (30) days after initially reporting the event, that provides the necessary information on the location (including the GPS coordinates), initial response action, remediation/clean-up, status of response (ongoing, complete), proposed disposal options for dealing with contaminated materials and preventative measures to be implemented.

13. The Licensee shall, in addition to Part F, Item 12, regardless of the quantity of releases of harmful substances, report to the NWT/NU Spill Line if the release is near or into a Water body.

PART G: CONDITIONS APPLYING TO ABANDONMENT, RESTORATION AND CLOSURE

1. The Licensee shall submit to the Board for approval an *Abandonment, Restoration and Closure Plan* at least six (6) months prior to abandoning any facilities or upon submission of the final design drawings for the construction of new facilities to replace existing ones. Where applicable, the Plan shall include information on the following:

    a. water intake facility;
    b. the water treatment and waste disposal sites and facilities;
    c. petroleum and chemical storage areas;
    d. any site affected by waste spills;
    e. leachate prevention;
    f. an implementation schedule;
    g. maps delineating all disturbed areas, and site facilities;
    h. consideration of altered drainage patterns;
    i. type and source of cover materials;
    j. future area use;
    k. hazardous wastes; and
    l. a proposal identifying measures by which restoration costs will be financed by the Licensee upon abandonment.

2. The Licensee shall provide to the Board for review, within ninety (90) days following the issuance of this Licence, a detailed report that includes but is not limited to the following, as requested by AANDC in its submission:

    a. Confirmation on whether or not the scrap metal pile reference in the 2012 annual

report was relocated to the waste disposal facility's secondary areas or was buried in trenches;

b. Designed drawing for any trenches used to burry scrap metals including cover design, type and size of material used as fill, degree of compaction, etc.;
c. Details on any hazardous materials/substances removed from the scrap metal pile debris, if the material was relocated to the waste disposal facility;
d. An assessment of whether or not the disposal area is subject to subsurface flow assuming that the waste was buried in trenches.

PART H: CONDITIONS APPLYING TO THE MONITORING PROGRAM

1. The Licensee shall maintain Monitoring Program Stations at the following locations:

Monitoring Program Station Identification	Description	Frequency	Status
CAM-1	Raw water supply intake at Water Lake	Monthly, Annually	Active (Volume)
CAM-2	Runoff from the Modified Solid Waste Disposal Facility	N/A	Inactive (Quality)
CAM-3	Effluent or sampling point within the Modified Sewage Lagoon Facility	Based operational needs	(Quality)
CAM-4	Effluent from the eastern-most control pond in the Modified Solid Waste Disposal Facility being discharged to the Retention Sewage Lagoon	Prior to discharge	Active (Volume) (Quality)
CAM-5	Final Discharge Point for effluent from the Retention Sewage Lagoon to the Sewage Wetland	Once at the beginning of discharge; one during the middle of discharge, and once near end of discharge	Active (Volume) (Quality)
CAM-6	Outfall area for the Sewage Wetland	Monthly, During periods of observed flow	Active Volume (Quality)

2. The Licensee shall measure and record, in cubic metres, the monthly and annual quantities of water pumped at Monitoring Program Station CAM-1, for all purposes.

3. The Licensee shall measure and record the annual quantities of sewage solids or sludge removed from the Modified Sewage Disposal Facility.

4. The Licensee shall inspect weekly, during the period of May and October, at Monitoring Program Stations, CAM-4, CAM- 5, and CAM-6, for Effluent or water flow in order to fulfill the monitoring requirements of Part D, Item 5 and/or Part H, Item 1. A record of inspections shall be maintained and made available to an Inspector upon request.

5. The Licensee shall sample at Monitoring Program Stations CAM-4, CAM-5, and CAM-6, monthly during periods of observed flow. Samples shall be analyzed for the following parameters:

Biochemical Oxygen Demand (BOD_5)	Fecal Coliforms
Total Suspended Solids	pH
Conductivity	Nitrate-Nitrite
Oil and Grease	
Magnesium	Calcium
Sodium	Potassium
Chloride	Sulphate
Total Hardness	Total Alkalinity
Ammonia Nitrogen	Total Zinc
Total Cadmium	Total Iron
Total Cobalt	Total Manganese
Total Chromium	Total Nickel
Total Copper	Total Lead
Total Aluminum	Total Arsenic
Total Mercury	Total Organic Carbon (TOC)*

6. The Licensee shall sample at Monitoring Program Stations CAM-5 and CAM-6, at least once prior to discharge, once during the middle of discharge and once near the completion of discharge event in order to verify compliance with relevant parameters under Part D, Item 5.

7. All sampling, sample preservation and analyses shall be conducted in accordance with methods prescribed in the current edition of *Standard Methods for the Examination of Water and Wastewater*, or by such other methods approved by the Board.

8. All analyses shall be performed in a laboratory accredited according to ISO/IEC Standard 17025. The accreditation shall be current and in good standing.

9. The Board has accepted the Plan entitled Quality Assurance and Control Plan – Lagoon and Landfill, dated November 2013, as accompanied by an approval letter from an Analyst (AANDC), submitted as additional information with the application.

10. The Licensee shall annually review and revise as necessary the Quality Assurance and Quality Control Plan, in Part H, Item 9, and submit any updates to the Board for review along with the relevant approval letter from the accredited laboratory.

11. The Licensee shall measure and record the annual quantities of sewage solids

removed from the Modified Sewage Disposal Facility and Modified Sewage Disposal Facility.

12. Additional monitoring stations, sampling and analyses may be requested by an Inspector.

13. The Licensee shall include all of the data and information required by the "Monitoring Program" complete with an interpretation and discussion of the results, in the Licensee's Annual Report, as required *per* Part B, Item 1, or as requested by an Inspector.

14. Modifications to the Monitoring Program may be made only upon written approval from the NWB. Requests for changes to the Monitoring Program should be forwarded to the NWB in writing, and should include the justification and appropriate evidence to support the change.