Annual Report-2018

Water Licence: 3BM-GJO 1828
[Previous Licence: 3BM-GJO 1318]

Submitted on: Feb 07, 2019

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Building Nunavut Together
Nunavuliuqatigiingniq
Bâtir le Nunavut ensemble
Nunavut

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

February 07, 2019

Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1L0
Attention: Richard Dwyer, Manager of Licensing, Manager of Licensing

RE: 3BM-GJO 1828 (previous 3BM- GJO 1318)- Annual Report 2018, Gjoa Haven

Dear Richard,

The Hamlet of Gjoa Haven is pleased to submit the Annual Report- 2018 of water uses and sewage, solid waste treatment and disposal in compliances to Water Licence 3BM-GJO1828 (previous License 3BM-GJO-1318). Copies of samples test reports are appended herewith.

The Licensee has made some efforts to sewage lagoon, solid waste and metal waste facilities operation and monitoring during the summer - fall which include lagoon liner repair, solid waste berm opening repair, animal carcass and unauthorized dump replacement, drainage grading, loose waste reduction, bulk metal segregation, hazardous waste and waste batteries secure containments. Facilities monitor and waste water & effluent sampling program carried during July-Sep in compliance to the Licence. Decanting to sewage lagoon water carried in Sep-Oct with control discharge into wetland using smaller size hose and pump due to failure of original decanting structure outlet gate valve. Samples test result shown a control on contaminants parameters within allowable limits with some exception of metal components from solid waste and metal dump leachate. We summarized those conditions and requirements **in Parts B - H**.

We hope that Nunavut Water Board will find this report and supporting test results valuable to Annual Report in operating the Water Licence for water, sewage and solid waste facilities of the hamlet of Gjoa Haven, Nunavut.

CGS is submitting this Annual Report 2018 on behalf of the Hamlet of Gjoa Haven.

Best Regards,

Shah Alam, P. Eng. E.P.
Municipal Planning Engineer,
Government of Nunavut, Community and Government Services
Kitikmeot Region, Cambridge Bay, Nu
Phone: 867-983-4156, fax: 867-983-4124
salam@gov.nu.ca<mailto:salam@gov.nu.ca>

CC: ED Devereaux, Senor Administrative Officer, Hamlet of Gjoa Haven, NU
Baba Pedersen, Resource Management Officer, AANDC

Hamlet of Gjoa Haven

Box 200 Gjoa Haven, Nunavut X0B-1J0
Phone: **(867) 360-7141**
Facsimile: **(867) 360-6309**

January 29, 2019

Shah Alam, P. Eng., E.P.
Municipal Planning
Engineer Community
and Government
Services Government
of Nunavut
Bag 200
Cambridge Bay, Nunavut X0B 0C0

Re: Authorization to Act on Behalf of the Hamlet

Dear Shah,
I hereby authorize you to act on behalf of the Municipality of Gjoa Haven in regards to our Water licence and the Annual Report submission to the Nunavut Water Board.

Regards,

Ed Devereaux
Senior Administrative Officer
Hamlet of Gjoa Haven
Phone: 867-360-7141 Ex 202
saogjoa@qiniq.com

EXECUTIVE SUMMARY:

Hamlet of Gjoa Haven has prepared this Annual Report 2018 to be submitted to the Nunavut Water Board to meet requirements of the Water Board Licence 3BM-GJO 1828, Part B General Conditions to monitoring. This report covers the period from January 01, 2018 to December 31, 2018.

water drawn from the big Swan Lake through twin intake pumps, transformed to reheated stations by 6 inch HDPE buried line to 3.2 km away Treatment Plant building, treated water using pressure filters followed by chlorination, truck filled from outside with 2nd chlorination by hamlet trucks and delivered to household tanks for community potable water supply. Quantity of water uses during this period was about **47,400** m3 which is 3.2 % increase compared to previous year (45,919 m3), but within annual allowable limit 62,000 m3. Water uses mainly for residential, institutional, hotels, commercial, health centers, arena and other recreational activities.

Sewage waste collected from household sewage tanks using hamlet operated vacuum trucks, hauled to community sewage lagoon and discharged at the lagoon drop-off location. Raw sewage stayed inside the lagoon almost 9 months during the period Oct - Jun where freeze and received primary treatment naturally. Snow melts water along with melted sewage water decanted outside during Sep - Oct to reduce quantity inside and making room for new candidate raw sewage waste. Samples were collected from the lagoon monitoring station GJO-3A before decanting and tested at Taiga Laboratory Yellowknife. Effluent quality verified with samples results from GJO-2 and GJO-4.

Open area about 5.0 m long to the east-south corner of the solid waste berm was repaired using sand-gravel materials by the hamlet as directed by the AANDC inspector. Snow melted water with solid waste leachate run-off used to travel out freely when spring freshet and mixed with sewage water effluent before confirming the quality for discharging out. Solid waste run-off retained inside the facility until sample results from station GJO-5 shown parameters value within allowable limit. Waste batteries, waste oil and waste paint drums replaced inside C-cans placed at the Solid waste facility. Regular waste piled up at the facility using hamlet operated truck and pushed down to low area and inside trench and covered with sand-gravel materials from nearby area.

No issues of water line freeze up or water flow rate in the buried water line since some portion was replaced with HDPE insulated pipes of same diameter and upgrading of reheat stations, re-sizing of pumps and heat exchanger carried during 2015-2017 to continue water supply from intake pump house that has records of winter freeze-up. SCADA upgrade, PLC program and Chlorine measuring devices integrated the water treatment and monitoring properly.

Annual cleaning of water tank at the treatment plant carried without any disruption of water supply. Water chemical analysis carried at taiga Laboratory through samples results from raw water, treated supply water and storage tanks. Water quality monitored for E. coli or Coliform through monthly sampling and testing at EHO lab in Cambridge Bay. Increased amount of Chlorine in treated water were reported in some occurrences but minimized such escalation.

General Conditions:

- Tabular Form of Annual water consumption and sewage disposal are filled from the record on daily basis of water distribution and sewage disposal. No device Meter was used for volume measurement, however, truck-fill measurements considered conveniently accurate.
- No modification to sewage lagoon, wetland or solid waste facilities during this period
- No unauthorized discharge or disposal to effluent or waste during this period.
- O&M manuals for water intake, treatment, SCADA system, Chlorine dosing, sewage and solid waste collection, disposal and facilities operations remains active since last update in 2017.
- New locations for Monitoring stations GJO-2 and GJO-4 marked on best location options and updated with signs as directed by the Inspector.
- Plan of Compliance remained active, informative and implemented as approved before.

Water Uses:

- All water drawn from the approved source Swan Lake for community potable water supply of about **47,400** cubic metres which is within the allowable annual limit **62,000** cubic metres, but an increased quantity of about 3.2 % compared to previous year.
- No erosion at the intake point or close proximity of pumps intake screen inside the lake which is cleared from the Lake bed and allowances from frozen layer on top by 3m plus. No materials were removed from lake or intake bed near the screen.

Waste Disposal

- The municipal sewage waste contained both grey and black water from urinal, toilet flush mixed with bath and kitchen water in the same tank. Combined sewage stay inside house tanks for average 3-4 days before collecting by vacuum truck and discharge into the lagoon.
- Amount of sewage generated during this period (Jan – Dec, 2018) is less than 45,000 m3. Sewage is calculated considering 90-95 % of water supply by truck.
- Sewage and solid waste discharged to the sewage lagoon and waste facility using hamlet operated trucks. Sewage and effluent samples from station GJO-3A and Final Discharge Point GJO-4 results shown contaminants parameters within allowable limits (FC: 10,000 CFU/dl; BOD_5:80; TSS: 100; P^H: 6-9; Oil & grease: none for station GJO-4). Results attached including a summary.
- Freeboard at sewage lagoon maintained 1.0 m or more measured from berm top. Any water above the Discharge Chute is allowed to free-flow outside which could happened only in early spring freshet when snow melt water increases the water level inside the lagoon.
- The existing wetland tied with the small area of decanting structure from the new lagoon facilities for effluent remediation. Test results shown the effluent from Final Discharge Point (GJO-4) were within limiting values of parameters BOD, TSS, P^H) and not acutely toxic to Rainbow Trout or crustacean fish food.

Non-hazardous domestic Solid Waste:

- Solid wastes collected from community waste bins by hamlet operators, hauled in to waste facility by covered truck and piled up in designated location inside the facility during fall and winter, then pushed those piles down to lower graded area and trenches, packed and covered with sand-gravel using grader and packer.
- Solid waste leachate run-off from the downstream sump at GJO-5, sample tested at Taiga.
- Light materials, paper, paper boards and loose materials reduced by slow burning inside and push down burn ashes under the cover materials.
- Animal carcass were picked up from solid waste outsides (east and south sides), buried in trench and covered with sand-gravel by hamlet operators.
- The AANDC inspector has raised this concern during the facility inspection and requested the hamlet to manage those unauthorized dumps until a separate cell-facility build inside. This requirement will be considered with the Solid Waste Study and improvement project

Modification, construction, operation, A&R

- No modifications to water intake, treatment plant during this year.
- Ripped liner repair at the drop-off location of sewage lagoon done, but wasn't possible to re-check the liner welding works, which can be carried in next year summer.
- Berm opening re-instated by using sand-gravel at the south-east corner of the solid waste.
- Operational manual and as-built drawings of SCADA upgrading, PLC system and Chlorine measuring devices submitted to the Board.
- No spills and no reclamation activities related to vegetation growth or seed deposition done during this year.

Monitoring Program:

- Annual monitoring of sewage and solid waste effluent carried Jul-Oct by the hamlet.
- Annual cleanup to water storage tank carried and water samples tested before delivery.
- Effluent samples test results from Taiga Laboratory are included in the report.
- Station GJO-4 noted as the Final Discharge point from wetland to ocean, therefore, values of parameters limit are mostly applicable for sample taken from this station.
- Station GJO-5 can be moved close near to the lowest graded sump area near to north-east corner of solid waste facility and facility will be graded accordingly.

NWB Form

Annual Report - 2018

Water Licence: 3BM-GJO 1828

[Previous: 3BM-GJO 1318]

Hamlet of Gjoa Haven, NU

ANNUAL REPORT

YEAR BEING REPORTED: 2018

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water Licence 3BM-GJO-1828 issued to the Hamlet of Gjoa Haven
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i) - iii) tabular summaries of all data generated under the "Monitoring Program"; monthly and annual quantities in cubic metres of freshwater obtained from all sources; monthly and annual quantities in cubic metres of each and all wastes discharged;

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

Month Reported	Quantity of Water Obtained from all sources (litres)	Quantity of Sewage Waste Discharged
January	4,721,934.18	Same
February	3,717,538.70	Same
March	4,121,522.80	Same
April	3,884,150.10	Same
May	3,977,935.60	Same
June	3,658,821.70	Same
July	3,672,737.10	Same
August	3,876,674.10	Same
September	3,795,469.10	Same
October	4,046,551.90	Same
November	3,983,909.90	Same
December	3,930,097.93	Same
ANNUAL TOTAL	**47,387,342.93**	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;

- No modification or major maintenance needed to water treatment plant or intake pumphouse. The only maintenance carried to chlorine dosing pump control and truckfill arm hose.
- PLC control system, SCADA and Free Chlorine measuring devices upgrading works re-visited for treatment plant which was completed in previous year 2017 by consultants.
- Berm opening repaired using gravel- soil-sand from local source and perimeter fence was re-fixed tightening with vertical posts on berm of solid waste facility.
- Cleared road area for dump truck access and levelled ponding spots of solid waste facility.
- Graded trench for solid waste run-off collection towards the sump area near the berm at GJO-5
- Opened the decanting structure exit valve gate and arranged new gate valve to replace it.

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

- No reportable unauthorized discharge except the water storage tank clean-up water discharged.
- Free flow of solid waste run-off with snow-melt water through the open area, but not calculated.
- Effluent overflows on wide area wetland instead of trench-line along GJO-4 when summer freshet, but it helps to contaminant parameters polishing in the presence of sunlight and wind flow.

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

- No abandonment or restoration work carried for water system and no plan for next year.
- Filled up the perimeter berm open spot and reinstated loose fence at solid waste facility
- Plan for fencing and gating the entrance of solid waste facility if funded for next year.
- A study project for solid waste facility improvement or renovation if suggested. Consultant contract awarded together with Taloyoak Solid Waste improvement study project and expected starts of facility feasibility study, waste inventory, survey, geotechnical and waste management scope set up by next spring-fall 2019.

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;

- Plan and requirement for solid waste facility improvement has been addressed in Amendment Licence application to the Board. Consultant has been hired under one contract with Taloyoak Solid Waste Improvement Study.
- Scope of the Study Project include site visit, interview to community reps, facility assessment and need requirements for improvement or new facility development, waste effluent sampling activities and full securement of waste types inside cells.

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

In the new amendment Licence 3BM-GJO 1828, the Board has requested an addendum to the Sewage Lagoon O&M manual, addressing the freeboard limit of sewage disposal, existing wetland details drawing showing distance from water bodies, soil characteristics, permeability/hydraulic conductivity and gradient which has been carried a condition from previous Licence.

Information of sewage lagoon area, effluent discharge location, wetland flow trench, monitoring stations, final merging point to water body, solid waste and metal dump, and any other related infrastructure information is attached in a page with this report. Sewage lagoon freeboard maintain to 1.0 -1.5 m during summer and fall. During winter, no flow of sewage water outside, but snow drift can be filled up above the freeboard limit or even upto top of berm. Once spring freshet starts, snow melts water come down to inside/outside and mostly stay within freeboard limit, otherwise excess water can free-flow outside on the free-flute structure. No changes to the standard O&M of sewage lagoon, but Dillon Consulting have submitted the operational manual of the sewage facility to the Board as part of Project and A&R plan of the old sewage facility.

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

- O&M manuals for Tank water Level sensor, Flow meter, FCL (Free Chlorine measuring) and PLC control system have already updated with previous approved manual of water treatment plant.
- No maintenance needed for water intake system, delivery or treatment, but a plan to bring the 2nd truckfill system operable which requires electrical switch and cabling works inside the building.
- Follow-up to lagoon liner welding that was repaired and any new spots by hamlet operators.
- Plan for cleaning sediment and grading the effluent water trench on wetland for smooth flow and reduce the deposition of effluent sediment which supposed to be remediated and flow down.

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

- Monitoring to Water Treatment Plant and water supply has been improved to the desired level through the improvement of SCADA and accessories including water level sensor, flow meter, chlorine analyser, UPS, auto dialler and HMI comfort panel.
- Chlorine dosing sometimes needs manually adjusted by the operator as needed specifically with the changes of turbidity in intake water, flow rate and water body temperature. CGS hired operator is managing the WTP with casual person and locally available resources as needed.
- Backwash to water treatment storage tank clean-up annually and (as needed).
- Level of Cl_2 sometimes reduced in overnight storage water and the operator add Chlorine solution to cover the demand before water delivery to household tank.
- Regular daily test at least one time per truck. Chlorine Log sheets are maintained
- The treatment plant operator carries Chlorine test on weekly basis for E. coli and Total Coliform.
- Water chemical tests and sewage water/ effluent tests were carried at Taiga Lab in Yellowknife.

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

Follow up update were carried in regards to AANDC inspection on July 13, 2018 (Ref. Report)

- HDPE liner was repaired by placing a new liner piece on top of existing liner covering all the 4 spots as reported in AANDC inspection report. The new liner was welded along the perimeter with the existing liner and it covered all 4 spots and concern of any nearby area damage in future. Monitoring station GJO-4 moved to new location N 68^0 36′ 59.8″and W 95^0 49′ 48.1″ as the best representation of Final station of effluent run-off towards the Ocean. GJO-2 moves to new location with GPS address: N 68^0 37′ 13.7″ and W 95^0 50′ 23.2″. Signage was installed at this station for sampling point and awareness information of run-off.
- Lagoon water decanted using alternate mechanical pump but very slowly due to breakdown of the gate valve of original decanting structure. A new gate valve was purchased but installation can be next year as the season was over for such integration.
- Open areas at the solid waste berm was repaired as reported and with satisfaction of AANDC inspector in 14 days deadline.

TABLE-1

Water Analysis - 2018

Water Licence: 3BM-GJO 1828

[Previous: 3BM-GJO 1318]

Hamlet of Gjoa Haven, NU

Community: Gjoa Haven 2018

Test type	Parameters	Units	MAC	August 17, 2018 GJO-1 Raw Water	Overnight Truck Treated Water	WTP Treated Water	Truckfill Treated Water
Physicals	Colour	TCU	<=15				
	pH		7.0 - 10.5	8.28	8.26	8.25	8.26
	Turbidity	NTU	<=5	0.52	0.52	0.56	0.46
	TDS	mg/L					
	TSS	mg/L		< 3	< 3	< 3	< 3
	Alkalinity	mg/L		100	100	100	101
	Conductivity	µS/cm		496	508	509	509
Nutrients	Dissolve C	mg/L	45	3.5	3.7	3.8	3.7
	Total C	mg/L		4.7	4.6	4.4	4.3
	P, Total	mg/L					
Inorganics	Sulphide	mg/L	<= .05 **AO***		< 0.0180	< 0.0180	< 0.0180
Organics	Benzene	mg/L	0.005		< 0.00050	< 0.00050	< 0.00050
	Ethylbenzene	mg/L	0.14		< 0.00050	< 0.00050	< 0.00050
	Cyanide	mg/L	0.2	< 0.0050	< 0.0050	< 0.0050	< 0.0050
	THMs	mg/L	0.1		0.1600	0.1650	0.115
	Phenol, Tot	mg/L		0.0019	0.0018	0.0016	0.0018
	Toluene	mg/L	0.06		< 0.00450	< 0.00050	< 0.00450
	Bromo-CH4	mg/L			0.0349	0.0360	0.0221
	Xylenes	mg/L	0.09		< 0.00050	< 0.00050	< 0.00050
Major Ions	Nitrate N	mg/L		0.34	0.14	0.15	0.13
	Hardness	mg/L		102	101	95.2	99.4
	Chloride	mg/L	<=250	83.5	86.8	87.0	87.3
	Fluoride	mg/L					
	Sodium	mg/L	<=200	46.2	48	54.3	42.9
	Sulphate	mg/L	<=500	10	10	10	10
	Magnesium	mg/L		8.4	8.3	7.2	7.2
	Calcium	mg/L		27.2	26.9	26.3	27.9
Microbiology	Total Coli	CFU	none				
	E. Coli	CFU	none				
	Fecal Coli	CFU	none	< 1	< 1	< 1	< 1
Metals(T)	Aluminium	µg/L	<100	5.5	25.2	5.9	29.9
	Arsenic	µg/L	100	0.3	0.4	0.4	0.4
	Barium	µg/L	1				
	Beryllium	µg/L		< 0.1	< 0.1	< 0.1	< 0.1
	Cadmium	µg/L	5	< 0.04	< 0.04	< 0.04	< 0.04
	Chromium	µg/L	50	< 0.1	< 0.1	< 0.1	< 0.1
	Cobalt	µg/L		< 0.1	< 0.1	< 0.1	< 0.1
	Copper	µg/L	<=1000	< 0.2	20	21.4	20.8
	Iron	µg/L	<=300	7	65	60	50
	Lead	µg/L	10	< 0.1	0.3	0.2	0.3
	Manganese	µg/L	<=50	6.6	6.7	7.3	6.7
	Selenium	µg/L	50	< 0.3	< 0.3	< 0.3	< 0.3
	Uranium	µg/L	20				
	Zinc	µg/L	<=5000	< 0.4	71.8	85.0	71.5
	Mercury	µg/L	1	< 0.01	< 0.1	< 0.01	< 0.01
	Nickel	µg/L		< 0.1	< 0.1	0.1	< 0.1
Organics	Benzene	mg/L			< 0.00050	< 0.00050	< 0.00050
	Ethylbenzene	mg/L			< 0.00050	< 0.00050	< 0.00050
	Cyanide	mg/L	0.2	< 0.0050	< 0.0050	< 0.0050	< 0.0050
	THMs	mg/L	0.1		0.1600	0.1650	0.115
	Phenol, Tot	mg/l		0.0019	0.0018	0.0016	0.0018
	Toluene	mg/L			< 0.00450	< 0.00050	< 0.00450
	Bromo-CH4	mg/L			0.0349	0.0360	0.0221
	Xylenes	mg/L			< 0.00050	< 0.00050	< 0.00050

GCDWQ=Guidelines for Canadian Drinking Water Quality
IMAC=Interim maximum acceptable concentration
MAC=Maximum acceptable concentration
AO=Asthetic Objectives
ND=Not defined

TABLE-2

Sewage Effluent analysis - 2018

Water Licence: 3BM-GJO 1828

[Previous: 3BM-GJO 1318]

Hamlet of Gjoa Haven, NU

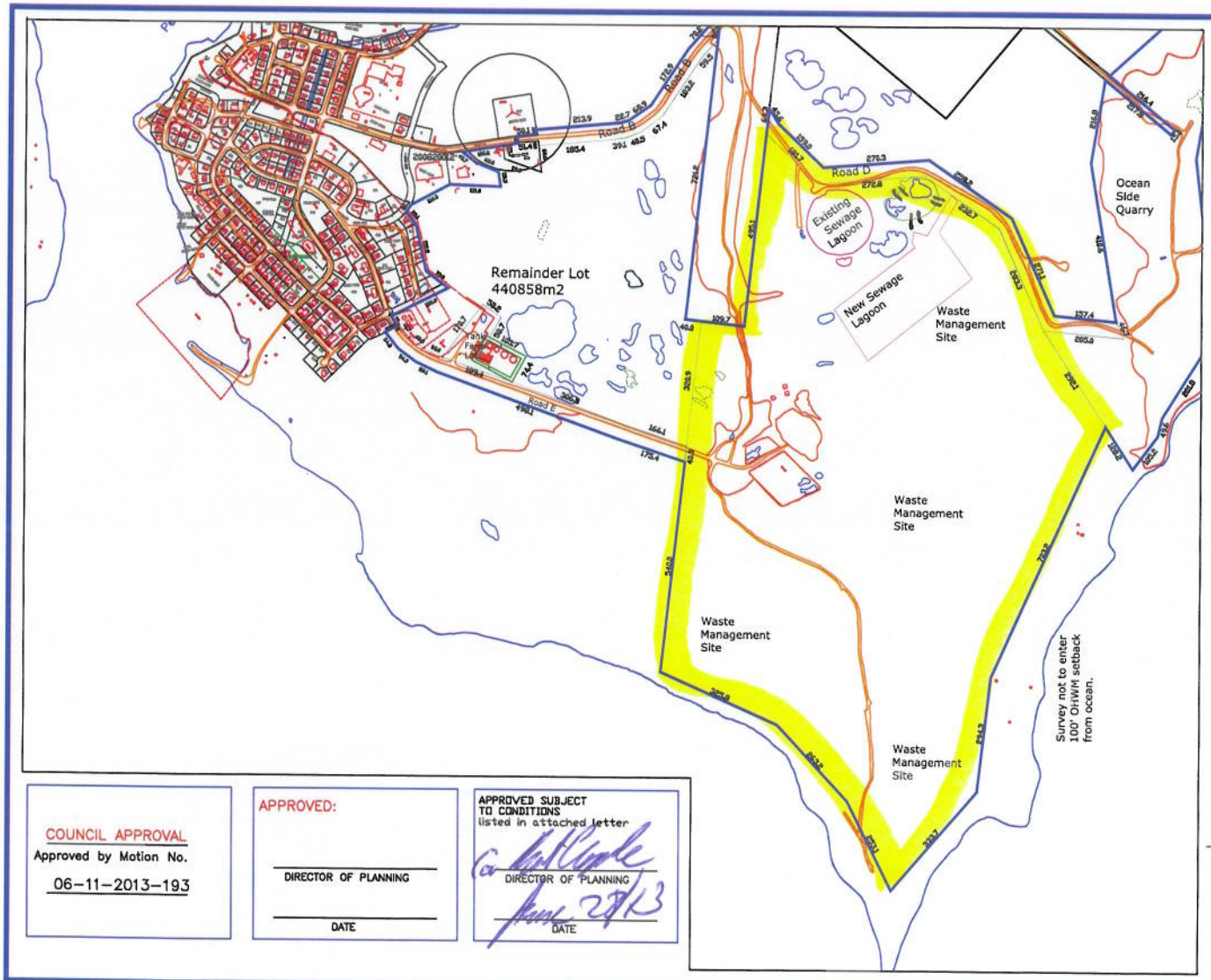
Sewage Effluent Results: Gjoa Haven 2018

Parameters	Units	MAC Limits GJO-4	July 23rd 2018			
			Solid Waste GJO-2	Sewage Lagoon GJO-3A	Final Discharge GJO-4	Solid Waste Runoff
Alkalinity	mg/L		191	465	172	504
Conductivity	µS/cm		780	1580	596	2340
P^h	p^h	6-9	7.99	7.59	8.09	7.12
TSS	mg/L	100	20	14	< 3	56
Ammonia as N_2	mg/L			1.99		132
BOD_5	mg/L	80	36	91	8	96
CBOD	mg/L		41	94	9	95
Dissolved, C	mg/L					
Total, C	mg/L		26.7	136	13.0	232
Nitrate as N_2	mg/L	45	5.11	0.50	3.76	0.40
Nitrite as N_2	mg/L	3	0.35	< 0.01	0.13	< 0.01
Calcium	mg/L	32	35.5	26.7	34.9	266
Chloride	mg/L	100	69.6	165	44.5	134
Hardness	mg/L	500	197	151	185	801
Magnesium	mg/L		26.3	20.5	23.9	33.0
Potassium	mg/L		18.8	56.3	6.4	59.1
Sodium	mg/L	200	72.6	123	51.3	140
Sulphate	mg/L	500	64	10	44	551
Fecal Coliform	CFU/100mL	$1x10^6$	< 100	$7x10^4$	1	650
Oil & Grease, Visible	Visibility			Non Visible	Non-visible	Non-Visible
Aluminium	µg/L	200	33.3	112	9.9	243
Arsenic	µg/L	25	6.7	1.1	1.3	5.6
Cadmium	µg/L	5	< 0.1	< 0.1	< 0.1	1.6
Chromium	µg/L	50	0.4	0.9	0.2	4.5
Cobalt	µg/L	50	1.7	0.6	0.8	9.5
Copper	µg/L	200	4.6	123	4.6	166
Iron	µg/L	500	1760	466	101	28300
Lead	µg/L	10	0.7	0.9	0.2	36.3
Manganese	µg/L	50	168	37.8	11.4	1260
Mercury	µg/L				< 0.01	0.09
Nickel	µg/L	200	6.2	2.7	3.9	36.5
Zinc	µg/L	500	< 5.0	110	< 5.0	1330

Facilities Location and Monitoring Stations

Water Licence: 3BM-GJO 1828

Hamlet of Gjoa Haven, NU



COUNCIL APPROVAL
Approved by Motion No.
06-11-2013-193

APPROVED:

DIRECTOR OF PLANNING

DATE

APPROVED SUBJECT TO CONDITIONS listed in attached letter

DIRECTOR OF PLANNING

June 27/13
DATE

GJOA HAVEN

LEGEND

SURVEY BOUNDARY

LINES WITHIN BOUNDARY TO BE SURVEYED

SKETCH SHOWING
PROPOSED SUBDIVISION
GJOA HAVEN
(1 Lot) GJOA 415 (40-2) 13-006

NOTE:
- SURVEY 1 LOT – WASTE MANAGEMENT OTHER PORTION LOTS ARE VISIBLE.
- SURVEY TO BE TIED TO ALL CONTROL POINTS IN THE VICINITY
- TIES ARE REQUIRED TO ALL BUILDINGS AND IMPROVEMENTS INCLUDING ROADS, LAKES, AND PONDS
- LANDS INVOLVED IN SURVEY ARE COMMISIONERS LANDS.
- ALL SPLAYS ARE 5m
- FIT TO EXISTING ROADS

DATE: JUNE 26, 2013

SCALE 1:250 (0.004)

CRD
INITIALS

415 (40-2) 13-006
SKETCH NUMBER

Gjoa Haven Water Licence: 3BM-GJO-1318

Monitoring Stations of sewage and solid waste sample collection

Sampling Station	GPS Location		Description	Frequency	Comments
	Latitude	Longitude			
GJO-1	N 68^0 39′ 22.9″	W 95^0 55′ 06.5″	Raw Water source at Swan Lake	Volume of water (Monthly)	No change
GJO-2	N 68^0 37′ 05″	W 95^0 50′ 42″	Solid Waste leachate discharge location		
GJO-2 (new)	N 68^0 37′ 13.7″	W 95^0 50′ 23.2″	Sewage discharge on wetland location	Outside the berm monthly (May-Aug)	**Changed**
GJO-3	N 68^0 37′ 28.8″	W 95^0 50′ 21.9″	Sewage truck offload point	From lagoon when decanting	**At new Lagoon decanting point**
GJO-4	N 68^0 37′ 23″	W 95^0 50′ 39″	Sewage effluent Final discharge on wetland		
GJO-4 (new)	N 68^0 36′ 59.6″	W 95^0 49′ 48.0″	Sewage effluent Final discharge point	On wetland Monthly (May-Aug)	**Change location**
GJO-5	N 68^0 37′ 05″	W 95^0 50′ 44″	Solid Waste Leachate retention sump pit.	only when decanting requires	No change

Notes:

- Suggested location of GJO-4 (new) is based on the trend of sewage effluent flow on wetland
- Old GJO-3 is moved from previous location to new truck off-load point at the new lagoon.
- Station GJO-5 is inside the Solid waste facility secured by berm. Sampling from GJO-5 is carried when requires decanting of effluent-water, mostly happened in mid-summer.
- changes of GJO-2 location by sequence location

Appendix: C

AANDC Inspection Report- 2018

Water Licence: 3BM-GJO 1828

[Previous: 3BM-GJO 1318]

Hamlet of Gjoa Haven, NU

WATER LICENCE INSPECTION FORM

☒ **Original**
☐ **Follow-Up Report**

Licensee	**Licensee Representative**
Hamlet of Gjoa Haven	Dave Stockley
Licence No. / Expiry	**Representative's Title**
3BM-GJO1318	Senior Administrative Officer
Land / Other Authorizations	**Land / Other Authorizations**
Date of Inspection	**Inspector**
13 and 27 July 2018	Baba Pedersen

Activities Inspected

☐ Camp ☐ Drilling ☐ Mining ☐ Construction ☐ Reclamation ☐ Fuel Storage
☐ Roads/Hauling ☐ Other: ☒ Other: Municipal Water License

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

Water Use	Condition	Comment	**Site Conditions**	Condition	Comment	**Haz/Mat Management**	Condition	Comment
Intake/Screen			Water Management Structures	C	3	Storage		
Flow Measure. Device	A	2	Culverts / Bridges			Spills		
Source:			Drainage	A	7 & 9	Spill Plan		
Water Use:	A	2	Erosion / Sediment					
Recirculation (y /n)			Mitigation Measures	C	5	**Administrative**		
			Reclamation Activities			Records	A	
			Materials Storage			Reports	A	
Waste Disposal			Signage	A	6 & 8	Plans		
Waste Water	C	4				Notifications	A	
Solid Waste			**Monitoring**			**Other**		
Hazardous Waste			Sample Collection / Analysis	C	4	License Renewal	C	1

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

Samples taken by Inspector:	Location(s): Samples were not taken during this Inspection as the Lab in Yellowknife was not available to receive them within required time limits.
☐ Yes ☒ No	

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

On July 13, 2018 I Inspected the Hamlet of Gjoa Haven's Municipal Water License 3BM-GJO1318. I saw the Sewage Lagoon, the Garbage/Metal Dump and all associated Sampling Stations. I was accompanied by Sabrina Karnouk and Laura Kim from Environment Canada, Shah Alam from GN CGS, as well as Anthony and Dominique from the Hamlet of Gjoa Haven.

On July 27, 2018 I did a Follow-up Inspection of the Garbage Dump Berm Repair Work and Relocation of Sample Station GJO-4. I was accompanied by Anthony from the Hamlet of Gjoa Haven for this Inspection.

SECTION 2 ☒ **Comments** ☐ **Non-Compliance with Act or Licence** ☐ **Action Required**

1. This Water License is Expiring in 2018, the Hamlet submitted the Renewal Application to the NWB last month. 2. The Hamlet has used 24,080 m3 of water in the first 6 Months of this year. 3. The Sewage Lagoon Liner was Torn in 4 places (Photos 1 & 2) at the Truck Dumping Station. 4. The Sewage Lagoon was almost full (Photo 3). 5. There was Debris Floating in one corner (also Photo 3) of the Sewage Lagoon. 6. Current Sample Station GJO-4 (Photo 4) does not reflect the best location to properly show Final Discharge Criteria in the Water License. 7. At the back corner of the Garbage Dump I found a Breach in the Containment Berm (Photos 6 & 7). 8. During my July 27th follow-up Inspection, I saw where the Hamlet relocated Sample Station GJO-4 (Photo 8) as per my previous Instructions. 9. Also during my July 27th follow-up Inspection, I saw the repairs to the Garbage Dump Containment Berm (Photos 9 & 10).

SECTION 3 ☐ **Comments** ☐ **Non-Compliance with Act or Licence** ☒ **Action Required**

1. The Hamlet must continue the Renewal Process with the NWB until their new Water License is issued. 2. The Hamlet is well within their allowable Annual Limit of 62,000 m3. 3. The 4 Tears in the Sewage Lagoon Liner must be repaired after the Decant Program is complete. 4. The Lagoon needs to be Sampled then Decanted prior to Freeze up. 5. The floating Debris must be removed from the Lagoon prior to Freeze up. 6. Sample Station GJO-4 needs to be moved to the new location (Photo 5) at N 68* 36' 59.8" W 95* 49' 48.1" to better show Final Discharge Criteria. 7. I gave verbal Instructions to the Hamlet to have the Breach repaired within 14 days. I also followed this up with an email with the same instructions a few days later. 8. Thank you for relocating Sample Station GJO-4 as per my Instructions. 9. Excellent work on repairing the Breach in the Garbage Dump Containment Berm within my specified time frame, thank you for the Hamlet's prompt and thorough response.

Licensee or Representative	Inspector's Name
	Baba Pedersen
Signature	**Signature**
	Signed Original on File
Date	**Date**
	25 October 2018

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

cc. CIRNAC, Manager Field Operations, Iqaluit, justin.hack@canada.ca

Nunavut Water Board, Manager of Licensing, Gjoa Haven, licensing@nwb-oen.ca

Gov't of Nunavut, Municipal Engineer, Cambridge Bay, salam@gov.nu.ca

PHOTO LOG

Date	Camera	Inspector	Authorization
13 & 27 July 2018	Sony DSC-HX50V	Baba Pedersen	3BM-GJO1318

Photo Log # DSC02809 **Sewage Lagoon**

Photo 1

Description: Tear #1 and #2 in Sewage Lagoon Liner at Truck Dumping Location requiring Repair after Decanting – July 13th

Photo Log # DSC02811 **Sewage Lagoon**

Photo 2

Description: Tear #3 and #4 in Sewage Lagoon Liner at Truck Dumping Location requiring Repair after Decanting – July 13th

Photo Log # DSC02827	Sewage Lagoon

Photo 3

Description: Sewage Lagoon showing high level of Liquid Contents and Floating Debris – July 13th

Photo Log # DSC02889	Old Sample Location GJO-4

Photo 4

Description: Old Sample Station GJO-4 – Final Discharge – to be moved to new location to better reflect Final Discharge Criteria – July 13th

Photo Log # DSC02881	New Sample Location GJO-4
Photo 5	N 68* 36' 59.8" W 95* 49' 48.1"

Description: New location of Sample Station GJO-4 to better reflect Final Discharge Criteria – July 13th

Photo Log # DSC02886	Garbage Dump
Photo 6	

Description: View #1 of Breach in Dump Berm – Directed to Repair within 14 Days – July 13th

Photo Log # DSC02887	Garbage Dump
Photo 7	

Description: View #2 of Breach in Dump Berm – Directed to Repair within 14 Days – July 13th

Photo Log # DSC03124	New Sample Location GJO-4
Photo 8	N 68* 36’ 59.8” W 95* 49’ 48.1”

Description: Confirmation of New location of Sample Station GJO-4 to better reflect Final Discharge Criteria - July 27th - Thank You

Photo Log # DSC03118	Garbage Dump

Photo 9

Description: View #1 of Repair to Breach in Dump Berm as Directed – July 27th – Very Nice Job – Thank You

Photo Log # DSC03120	Garbage Dump

Photo 10

Description: View #2 of Repair to Breach in Dump Berm as Directed – July 27th – Very Nice Job – Thank You