

ANNUAL REPORT FOR THE MUNICIPALITY OF GJOA HAVEN

YEAR BEING REPORTED: 2022

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water License No. 3BM-GJO1828 issued to the Municipality of Gjoa Haven.

- a) **tabular summaries of all data generated under the “Monitoring Program”;**
- b) **summary of modifications to the “Monitoring Program” in accordance with Part H, Item 13;**
- c) **the daily, monthly and annual quantities in cubic metres of freshwater obtained from all sources;**
- d) **the daily, monthly and annual quantities in cubic metres of each and all waste discharged; including the hazardous and non-hazardous waste accepted at the Solid Waste Facilities;**

Attached are quantities of water used as reported by the Municipality and the estimated discharge of sewage waste based on quantities used.

Month Reported	Quantity of Water Obtained from all sources (L)	Quantity of Sewage Waste Discharged (Estimated, m³)
January	4,189,863.2	Same
February	2,538,905.13	Same
March	2,047,459.38	Same
April	4,570,131.89	Same
May	4,148,088.81	Same
June	5,270,368.40	Same
July	4,416,553.40	Same
August	4,691,641.20	Same
September	4,191,276.40	Same
October	5,275,728.26	Same
November	4,404,205.30	Same
December	4,064,458.90	Same
ANNUAL TOTAL	49,808,680.3	Same

Note: Monthly sewage discharge volume is considered as equal to the monthly water consumption volume.

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- e) 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;**
 - There were no modifications and/or major maintenance work carried out on the Water Supply and Waste Disposal Facilities in 2022.
- f) a list of unauthorized discharges and summary of follow-up action taken;**
 - None
- g) a summary of any abandonment and restoration work completed during the year and an outline of any work anticipated for the next year;**
 - There was no abandonment and restoration work completed during 2022. There is no abandonment and restoration work anticipated for 2023.
- h) a summary of any studies, reports and plans (e.g., Operation and Maintenance, Abandonment and Restoration, QA/QC) requested by the Board that relate to waste disposal, water use or reclamation, and a brief description of any future studies planned;**
 - The initial planning study for the Solid Waste Project was completed in 2020/21. A second planning contract to assess and prioritize the improvements to the current site is ongoing.
- i) any other details on water use or waste disposal requested by the Board by November 1st of the year being reported.**
 - There were no other details on water use or waste disposal requested by the Board by November 1, 2022.

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ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

- No flow at GJO-2 or GJO-4 until late July once the decant pumping began because this is an impermeable lagoon. No flow in Early September as well because decanting was complete. The sampling season was limited and as such samples were limited to that time frame when decanting was taking place.
- No flow at GJO-5 – decanting solid waste site was not planned due to lack of leachate. No sample taken.

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

- As per the 2020 CIRNAC Inspection, The License Holder must check the presumed tear in the Sewage Lagoon Berm Liner on the South Side of the Sewage Lagoon. The tear was repaired after thaw 2022.
- As per the 2020 CIRNAC Inspection, The License Holder shall repair the Damaged Section of the Garbage Dump Fence beside Sample Station GJO-5. The Fence was repaired late spring 2022.

List of Appendices

Appendix A: GJO-4 Effluent Quality Limits – 1 page

Appendix B: Laboratory Certificate of Analysis

- **Certificate of Analysis 07/27/2022 - 6 pages**
- **Certificate of Analysis 08/03/2022 – 6 pages**

Appendix C: Gjoa Haven 2022 Sampling Summary – 1 page

Appendix D: CIRNAC Inspection Report - 1 page

Appendix E : Spill Report

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Appendix A: GJO-4 Effluent Quality Limits

3BM-GJO1828 Gjoa Haven Monitoring Program Results 2022 for Effluent Quality

Parameter	Maximum concentrati	GJO-4	
		July 27	August 03
CBOD	100 mg/L	-	80
Total Suspended Solids	100 mg/L	22	34
Fecal Coliforms	1×10^4 CFU/dl	-	12000
Oil + Grease	No visible sheen	Non-Visible	Non-Visible
pH	between 6 and 9	7.74	7.71

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Appendix B: Laboratory Certificate of Analysis

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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.:
221520

- CERTIFICATE OF ANALYSIS -

Client Sample ID: GJO-2

Taiga Sample ID: 001

Client Project:

Sample Type: SWF Effluent

Received Date: 28-Jul-22

Sampling Date: 27-Jul-22

Sampling Time:

Location: Gjoa Haven Sewage & Waste

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen	78.0	0.005	mg/L	03-Aug-22	TEL068	
Biochemical Oxygen Demand	151	2	mg/L	28-Jul-22	TEL019	
CBOD		2	mg/L		TEL019	97
<u>Inorganics - Physicals</u>						
Conductivity, Specific (@25C)	1480	0.4	µS/cm	28-Jul-22	TEL059	
pH	7.67		pH units	28-Jul-22	TEL058	
Solids, Total Suspended	18	3	mg/L	02-Aug-22	TEL008	
<u>Major Ions</u>						
Calcium	26.5	0.1	mg/L	03-Aug-22	TEL055	
Magnesium	23.4	0.1	mg/L	03-Aug-22	TEL055	
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	29-Jul-22	TEL055	
Potassium	24.6	0.1	mg/L	03-Aug-22	TEL055	
Sodium	116	0.1	mg/L	03-Aug-22	TEL055	
Sulphate	5	1	mg/L	29-Jul-22	TEL055	

Microbiology

Report Date: August-10-22

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

Taiga Batch No.:
221520

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GJO-2**

Taiga Sample ID: **001**

Coliforms, Fecal	24000	1000	CFU/100mL	28-Jul-22	TEL017	208
<u>Organics</u>						
Oil and Grease, visible	Non-visible			28-Jul-22	Visual Exam	
<u>Subcontracted Organics</u>						
Phenols, Total	0.0094	0.005	mg/L	08-Aug-22	AB ENV.06537	207
<u>Trace Metals, Total</u>						
Arsenic	1.2	0.2	µg/L	04-Aug-22	TEL035	
Cadmium	0.0	0.04	µg/L	04-Aug-22	TEL035	
Chromium	0.7	0.1	µg/L	04-Aug-22	TEL035	
Copper	109	0.2	µg/L	04-Aug-22	TEL035	
Iron	557	5	µg/L	04-Aug-22	TEL035	
Lead	0.8	0.1	µg/L	04-Aug-22	TEL035	
Mercury	0.07	0.01	µg/L	04-Aug-22	TEL035	
Nickel	2.5	0.1	µg/L	04-Aug-22	TEL035	

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

Taiga Batch No.:
221520

- CERTIFICATE OF ANALYSIS -

Client Sample ID: GJO-4

Taiga Sample ID: 002

Client Project:
Sample Type: Sewage
Received Date: 28-Jul-22
Sampling Date: 27-Jul-22
Sampling Time:
Location: Gjoa Haven Sewage & Waste
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen	67.7	0.005	mg/L	03-Aug-22	TEL068	
Biochemical Oxygen Demand	96	2	mg/L	28-Jul-22	TEL019	
CBOD		2	mg/L		TEL019	97
<u>Inorganics - Physicals</u>						
Conductivity, Specific (@25C)	1310	0.4	µS/cm	28-Jul-22	TEL059	
pH	7.74		pH units	28-Jul-22	TEL058	
Solids, Total Suspended	22	3	mg/L	02-Aug-22	TEL008	
<u>Major Ions</u>						
Calcium	30.8	0.1	mg/L	03-Aug-22	TEL055	
Magnesium	25.0	0.1	mg/L	03-Aug-22	TEL055	
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	29-Jul-22	TEL055	
Potassium	20.9	0.1	mg/L	03-Aug-22	TEL055	
Sodium	92.5	0.1	mg/L	03-Aug-22	TEL055	
Sulphate	10	1	mg/L	29-Jul-22	TEL055	
<u>Microbiology</u>						
Coliforms, Fecal	16400	100	CFU/100mL	28-Jul-22	TEL017	208

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

Taiga Batch No.:
221520

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GJO-4**

Taiga Sample ID: **002**

Organics

Oil and Grease, visible Non-visible 28-Jul-22 Visual Exam

Subcontracted Organics

Phenols, Total < 0.0010 0.001 mg/L 08-Aug-22 AB ENV.06537

Trace Metals, Total

Arsenic	2.2	0.2	µg/L	04-Aug-22	TEL035
Cadmium	< 0.0	0.04	µg/L	04-Aug-22	TEL035
Chromium	0.6	0.1	µg/L	04-Aug-22	TEL035
Copper	85.1	0.2	µg/L	04-Aug-22	TEL035
Iron	838	5	µg/L	04-Aug-22	TEL035
Lead	0.9	0.1	µg/L	04-Aug-22	TEL035
Mercury	0.05	0.01	µg/L	04-Aug-22	TEL035
Nickel	2.9	0.1	µg/L	04-Aug-22	TEL035

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

Taiga Batch No.:
221520

- CERTIFICATE OF ANALYSIS -

Client Sample ID: GJO-4

Taiga Sample ID: 002

- DATA QUALIFIERS -

Data Qualifier Descriptions:

- 207 *Detection limit adjusted due to sample matrix effects*
- 208 *Unreliable: Matrix interference*
- 97 *Analyst error, analysis was not completed.*

*** Taiga analytical methods are based on the following standard analytical methods**
SM - Standard Methods for the Examination of Water and Wastewater
EPA - United States Environmental Protection Agency

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Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

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

Taiga Batch No.:

221586

- FINAL REPORT -

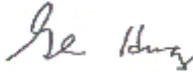
Prepared For: Hamlet of Gjoa Haven

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

Attn: Adam Halluqtalik

Facsimile: (867) 360-6309

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.

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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.:
221586

- CERTIFICATE OF ANALYSIS -

Client Sample ID: GJO-2

Taiga Sample ID: 001

Client Project:
Sample Type: SWF Effluent
Received Date: 04-Aug-22
Sampling Date: 03-Aug-22
Sampling Time: 9:30
Location: Gjoa Haven Sewage & Waste
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Cations by ICP-MS</u>						
Calcium	34.7	0.1	mg/L	08-Aug-22	TEL035	
Magnesium	30.9	0.1	mg/L	08-Aug-22	TEL035	
Potassium	32.4	0.1	mg/L	08-Aug-22	TEL035	
Sodium	125	0.1	mg/L	08-Aug-22	TEL035	
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen	0.732	0.005	mg/L	09-Aug-22	TEL068	
Biochemical Oxygen Demand	143	2	mg/L	04-Aug-22	TEL019	
CBOD	140	2	mg/L	04-Aug-22	TEL019	
<u>Inorganics - Physicals</u>						
Conductivity, Specific (@25C)	1610	0.4	µS/cm	04-Aug-22	TEL059	
pH	7.73		pH units	04-Aug-22	TEL058	
Solids, Total Suspended	32	3	mg/L	09-Aug-22	TEL008	
<u>Major Ions</u>						
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	05-Aug-22	TEL055	
Sulphate	7	1	mg/L	05-Aug-22	TEL055	

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

Taiga Batch No.:
221586

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GJO-2**

Taiga Sample ID: **001**

Microbiology

Coliforms, Fecal	59000	1000	CFU/100mL	04-Aug-22	TEL017
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Organics

Oil and Grease, visible	Non-visible			04-Aug-22	Visual Exam
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Subcontracted Organics

Phenols, Total	0.5980	0.01	mg/L	08-Aug-22	AB ENV.06537
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Trace Metals, Total

Arsenic	1.5	0.2	µg/L	09-Aug-22	TEL035
Cadmium	0.0	0.04	µg/L	09-Aug-22	TEL035
Chromium	0.7	0.1	µg/L	09-Aug-22	TEL035
Copper	104	0.2	µg/L	09-Aug-22	TEL035
Iron	650	5	µg/L	09-Aug-22	TEL035
Lead	0.7	0.1	µg/L	09-Aug-22	TEL035
Mercury	0.02	0.01	µg/L	09-Aug-22	TEL035
Nickel	2.6	0.1	µg/L	09-Aug-22	TEL035
Zinc	59.9	0.4	µg/L	09-Aug-22	TEL035

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

Taiga Batch No.:
221586

- CERTIFICATE OF ANALYSIS -

Client Sample ID: GJO-4

Taiga Sample ID: 002

Client Project:
Sample Type: Sewage
Received Date: 04-Aug-22
Sampling Date: 03-Aug-22
Sampling Time: 9:30
Location: Gjoa Haven Sewage & Waste
Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Cations by ICP-MS</u>						
Calcium	38.2	0.1	mg/L	08-Aug-22	TEL035	
Magnesium	30.8	0.1	mg/L	08-Aug-22	TEL035	
Potassium	25.5	0.1	mg/L	08-Aug-22	TEL035	
Sodium	101	0.1	mg/L	08-Aug-22	TEL035	
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen	61.1	0.005	mg/L	09-Aug-22	TEL068	
Biochemical Oxygen Demand	78	2	mg/L	04-Aug-22	TEL019	
CBOD	80	2	mg/L	04-Aug-22	TEL019	
<u>Inorganics - Physicals</u>						
Conductivity, Specific (@25C)	1320	0.4	µS/cm	04-Aug-22	TEL059	
pH	7.71		pH units	04-Aug-22	TEL058	
Solids, Total Suspended	34	3	mg/L	09-Aug-22	TEL008	
<u>Major Ions</u>						
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	05-Aug-22	TEL055	
Sulphate	14	1	mg/L	05-Aug-22	TEL055	
<u>Microbiology</u>						

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

Taiga Batch No.:
221586

- CERTIFICATE OF ANALYSIS -

Client Sample ID: GJO-4

Taiga Sample ID: 002

Coliforms, Fecal	12000	100	CFU/100mL	04-Aug-22	TEL017
<u>Organics</u>					
Oil and Grease, visible	Non-visible			04-Aug-22	Visual Exam
<u>Subcontracted Organics</u>					
Phenols, Total	0.3320	0.01	mg/L	08-Aug-22	AB ENV.06537
<u>Trace Metals, Total</u>					
Arsenic	2.3	0.2	µg/L	09-Aug-22	TEL035
Cadmium	< 0.0	0.04	µg/L	09-Aug-22	TEL035
Chromium	0.6	0.1	µg/L	09-Aug-22	TEL035
Copper	72.4	0.2	µg/L	09-Aug-22	TEL035
Iron	889	5	µg/L	09-Aug-22	TEL035
Lead	0.8	0.1	µg/L	09-Aug-22	TEL035
Mercury	0.02	0.01	µg/L	09-Aug-22	TEL035
Nickel	2.9	0.1	µg/L	09-Aug-22	TEL035
Zinc	39.9	0.4	µg/L	09-Aug-22	TEL035

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

Taiga Batch No.:
221586

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **GJO-4**

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

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Appendix C Gjoa Haven 2022 Sampling Summary

Parameter	Unit	GJO-2		GJO-4	
		July 27	August 03	July 27	August 03
BOD ₅	mg/L	-	-	-	-
TSS	mg/L	18	22	32	34
Faecal Coliforms	CFU/100mL	-	-	59000	12000
pH	pH	7.67	7.74	7.73	7.71
Conductivity	µS/cm	1480	1310	1610	1320
Ammonia Nitrogen	mg/L	78.0	67.7	0.732	61.1
Nitrate-Nitrite	mg/L				
Oil and Grease	Visibility	Non-Visible	Non-Visible	Non-Visible	Non-Visible
Total Phenols	mg/L	0.0094	<0.0010	0.5980	0.3320
Sulphate	mg/L	5	10	7	14
Magnesium	mg/L	23.4	25.0	30.9	30.8
Calcium	mg/L	26.5	30.8	34.7	38.2
Sodium	mg/L	116	92.5	125	101
Potassium	mg/L	24.6	20.9	32.4	25.5
Total Arsenic	µg/L	1.2	2.2	1.5	2.3
Total Cadmium	µg/L	0.0	<0.0	0.0	<0.0
Total Copper	µg/L	109	85.1	104	72.4
Total Chromium	µg/L	0.7	0.6	0.7	0.6
Total Iron	µg/L	557	838	650	889
Total Lead	µg/L	0.8	0.9	0.7	0.8
Total Mercury	µg/L	0.07	0.05	0.02	0.02
Total Nickel	µg/L	2.5	2.9	2.6	2.9
Total Zinc	µg/L	-	-	59.9	39.9

Appendix D: CIRNAC Inspection Report

The CIRNAC inspection did not take place in 2022.

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Appendix E: Spill Report

There were no spills associated with licenced infrastructure in 2022