ANNUAL REPORT
FOR THE MUNICIPALITY OF KUGAARUK

YEAR BEING REPORTED: 2023

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water License No. 3BM-PEL1929 issued to the Municipality of Kugaaruk.

a) **A summary report of Water use and Waste disposal activities;**
b) **Quantity of Water (in cubic metres per month and per year) obtained from all sources;**
c) **Quantity of Waste disposed of at the Waste disposal 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 (m^3)	Quantity of Sewage Waste Discharged (Estimated, m^3)
January	3,104.00	Same
February	2,951.99	Same
March	3,126.94	Same
April	3,074.99	Same
May	3,052.38	Same
June	2,766.01	Same
July	3,056.86	Same
August	3,022.18	Same
September	3,033.44	Same
October	2,955.70	Same
November	2,024.52	Same
December	1,272.50	Same
ANNUAL TOTAL	**33,441.50**	**Same**

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

d) Quantity of Waste backhauled to approved facility for disposal;

- As per generation rates in O&M Plan.

e) A list of unauthorized discharges and a summary of follow-up actions taken;

- There were no spills associated with licensed infrastructure in 2023. See Appendix C.

f) 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, including any revisions to the management plans submitted in the form of an Addendum;

- There are no studies, reports, or plans requested by the Board related to waste disposal, water use or reclamation. There are no future studies planned, including any revisions to the management plans submitted in the form of an Addendum.

g) A summary of all information requested and results of the Monitoring Program;

- The results of the Monitoring Program are summarized in Appendix D.

h) A summary, including photographic records before, during and after any relevant construction activities or Modifications and/or major maintenance work carried out on facilities under this License and an outline of any work anticipated for the next year;

- The upgraded lagoon was substantially complete in October 2020 and was used over the 2020/21 winter. Inspections by the consultant and contractor took place in October 2021.

- The consultant is currently finalizing the new waste water treatment O&M manual. Once it has been received it will be submitted to the NWB.

- On September 21, 2021, some pooling was observed below the southwest berm by municipal staff. Samples were taken on September 22nd and sent to Taiga Laboratory in Yellowknife. Results indicate it is effluent. The leak had dried by October 4th. The lagoon was still under warranty, so the consultant and contractor were notified. Once follow-up information is available it will be submitted to NWB. This is being reviewed by the consultant to develop a plan to monitor/repair.

- After thaw 2023, Hamlet employees reported the lagoon levels were lower than typical. Additionally, whalebacks and bubbles were observed in the liner. To investigate if there was a possible leak or tear in the liner after the previous year's repairs, the lagoon levels needed to be lowered at a quicker rate. Notification was provided to NWB of effluent temporarily diverted to the effluent berm. Once the lagoon was empty, no damage was identified visually. Further leak detection options are being reviewed. A copy of the Notification letter is included in Appendix F. Photos of the liner are included in Appendix G.

- Further inspection of the lagoon liner will take place in summer 2024. The consultant is planning lagoon liner repairs in summer 2024. Details will be provided with the 2024 Annual Report.

i) Any update on the Compliance Plan and progress made on specific requirements therein;

- There were no updates made to the Compliance Plan in 2023. The licensee does not have a copy of any Compliance Plan and cannot locate it on the NWB FTP site.

j) Any other details on Water or Waste deposit requested by the Board by November 1 of the year being reported.

- There were no other details on Water or Waste deposit requested by the Board by November 1 of 2023.

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

- No Flow at PEL-9-2
- PEL 3-2 is located at a pond between the lagoon and the wetland treatment area. This location for a compliance point is inconsistent with other municipal water licenses in Nunavut. PEL-4 which is at the outlet of the wetland treatment area should be the only compliance point and should be sampled only once decanting has begun since it represents fully treated effluent. The lagoon is not an exfiltration lagoon therefore sampling prior to decant gives no indication of the efficacy of effluent treatment.
- In October, TSS and Fecal Coliforms were in exceedance. An inspection of the liner was being performed and to complete the inspection before freeze-up, the sewage trucks were bypassing the lagoon to discharge directly into the downstream settling pond which would have reduced the quality of the effluent reaching PEL-4.
- The laboratory in Yellowknife evacuated due to wildfire from August 16th to September 13th. Samples were not being received which limited the sampling season.

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

- The 2023 CIRNAC Inspection took place May 24 2023. CIRNAC Inspector Jonathan Mesher and Hamlet Employee George Kakkianniun were in attendance. 2023 CIRNAC inspection reports were not received nor posted on the NWB public registry.

List of Appendices

Appendix A: PEL-3-2 and PEL-4 Effluent Quality Limits – 1 page
Appendix B: Laboratory Certificate of Analysis

- **Certificate of Analysis 07/06/2023 - 6 pages**
- **Certificate of Analysis 10/11/2023 - 7 pages**

Appendix C: Hazardous Materials Spill Database, Kugaaruk 2023 – 1 page
Appendix D: Kugaaruk 2023 Sampling Summary – 1 page
Appendix E: CIRNAC Inspection Report - 1 page
Appendix F: Receipt of Submissions to NWB – 1 page
Appendix G: Photos of incidents requiring maintenance – 7 pages

Appendix A: PEL-3-2 and PEL-4 Effluent Quality Limits

3BM-PEL1929 Kugaaruk Monitoring Program Results 2023 for Effluent Quality

Parameter	Maximum concentration of Any Grab Sample	PEL-3-2
		July 6
CBOD	100 mg/L	42
Total Suspended Solids	120 mg/L	66
Faecal Coliforms	$1x10^4$ CFU/dl	<10
Oil + Grease	No visible sheen	Non-Visible
pH	between 6 and 9	8.60

Parameter	Maximum concentration of Any Grab Sample	PEL-4	
		July 6	October 11
CBOD	100 mg/L	11	81
Total Suspended Solids	45 mg/L	32	219
Faecal Coliforms	$1x10^4$ CFU/dl	9	1020000
Oil + Grease	No visible sheen	Non-visible	Non-visible
pH	between 6 and 9	7.34	7.47

Appendix B: Laboratory Certificate of Analysis

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

Taiga Batch No.: 231011

- FINAL REPORT -

Prepared For: Hamlet of Kugaaruk

Address: Box 205
Kugaaruk, NU, X0B 1K0

Attn: **Chantal Dowden** **Facsimile:** **867-769-6069**

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.
- Results are based on the specific tests at the time of analysis, does not represent the conditions during sampling and relates only to the items tested.

Report Date: July 29, 2023
Print Date: *July 29, 2023*

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

Taiga Batch No.: 231011

- CERTIFICATE OF ANALYSIS -

Client Sample ID: PEL-3-2 **Taiga Sample ID:** 001

Client Project:
Sample Type: Sewage
Received Date: 07-Jul-23
Sampling Date: 06-Jul-23

Sampling Time: 9:00

Location: Kugaaruk Sewage and Solid Waste

Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	12.0	0.1	mg/L	07-Jul-23	TEL035	
Hardness	45.0	0.7	mg/L	07-Jul-23	TEL035	
Magnesium	3.6	0.1	mg/L	07-Jul-23	TEL035	
Potassium	6.8	0.1	mg/L	07-Jul-23	TEL035	
Sodium	16.4	0.1	mg/L	07-Jul-23	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	13.0	0.005	mg/L	10-Jul-23	TEL068	
Biochemical Oxygen Demand	41	2	mg/L	07-Jul-23	TEL019	
CBOD	42	2	mg/L	07-Jul-23	TEL019	
Organic Carbon, Total	18.1	0.5	mg/L	19-Jul-23	TEL033	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	86.6	0.4	mg/L	07-Jul-23	TEL060	

ReportDate: July 29, 2023
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Conductivity, Specific (@25C)	253	0.4	µS/cm	07-Jul-23	TEL059
pH	8.60		pH units	07-Jul-23	TEL058

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Taiga Batch No.: 231011

- CERTIFICATE OF ANALYSIS -

Client Sample ID: PEL-3-2 **Taiga Sample ID:** 001

Solids, Total Suspended	66	3	mg/L	13-Jul-23	TEL008
Microbiology					
Coliforms, Fecal	< 10	10	CFU/100mL	07-Jul-23	TEL017
Organics					
Oil and Grease, visible	Non-visible			07-Jul-23	Visual Exam
Subcontracted Inorganics					
Chloride	21.1	0.1	mg/L	13-Jul-23	EPA300.1
NO2+NO3 - N	0.0209	0.005	mg/L	13-Jul-23	EPA300.1
Sulphate	6.51	0.05	mg/L	13-Jul-23	EPA300.1
Subcontracted Organics					
Phenols, Total	0.0049	0.001	mg/L	13-Jul-23	AB ENV.06537
Trace Metals, Total					
Aluminum	96.7	0.6	µg/L	13-Jul-23	TEL035
Arsenic	0.5	0.2	µg/L	13-Jul-23	TEL035
Cadmium	< 0.04	0.04	µg/L	13-Jul-23	TEL035
Chromium	0.2	0.1	µg/L	13-Jul-23	TEL035
Cobalt	0.4	0.1	µg/L	13-Jul-23	TEL035
Copper	12.5	0.2	µg/L	13-Jul-23	TEL035
Iron	314	5	µg/L	13-Jul-23	TEL035
Lead	0.4	0.1	µg/L	13-Jul-23	TEL035
Manganese	42.8	0.1	µg/L	13-Jul-23	TEL035
Mercury	0.02	0.01	µg/L	13-Jul-23	TEL035
Nickel	0.9	0.1	µg/L	13-Jul-23	TEL035
Zinc	11.8	0.4	µg/L	13-Jul-23	TEL035

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Taiga Batch No.: 231011

- CERTIFICATE OF ANALYSIS -

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

Client Project:
Sample Type: Sewage Effluent
Received Date: 07-Jul-23
Sampling Date: 06-Jul-23

Sampling Time: 9:00

Location: Kugaaruk Sewage and Solid Waste

Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	40.2	0.1	mg/L	07-Jul-23	TEL035	
Hardness	433	0.7	mg/L	07-Jul-23	TEL035	
Magnesium	81.0	0.1	mg/L	07-Jul-23	TEL035	
Potassium	29.2	0.1	mg/L	07-Jul-23	TEL035	
Sodium	663	0.1	mg/L	07-Jul-23	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	5.68	0.005	mg/L	10-Jul-23	TEL068	
Biochemical Oxygen Demand	10	2	mg/L	07-Jul-23	TEL019	
CBOD	11	2	mg/L	07-Jul-23	TEL019	
Organic Carbon, Total	9.3	0.5	mg/L	19-Jul-23	TEL033	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	55.5	0.4	mg/L	07-Jul-23	TEL060	
Conductivity, Specific (@25C)	4190	0.4	µS/cm	07-Jul-23	TEL059	
pH	7.34		pH units	07-Jul-23	TEL058	
Solids, Total Suspended	32	3	mg/L	13-Jul-23	TEL008	
Microbiology						

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- CERTIFICATE OF ANALYSIS -

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

Coliforms, Fecal	9	1	CFU/100mL	07-Jul-23	TEL017
Organics					
Oil and Grease, visible	Non-visible			07-Jul-23	Visual Exam
Subcontracted Inorganics					
Chloride	1070	2	mg/L	13-Jul-23	EPA300.1
NO2+NO3 - N	0.141	0.0632	mg/L	13-Jul-23	EPA300.1
Sulphate	133	1	mg/L	13-Jul-23	EPA300.1
Subcontracted Organics					
Phenols, Total	< 0.0010	0.001	mg/L	13-Jul-23	AB ENV.06537
Trace Metals, Total					
Aluminum	215	0.6	µg/L	13-Jul-23	TEL035
Arsenic	0.8	0.2	µg/L	13-Jul-23	TEL035
Cadmium	< 0.04	0.04	µg/L	13-Jul-23	TEL035
Chromium	0.4	0.1	µg/L	13-Jul-23	TEL035
Cobalt	0.4	0.1	µg/L	13-Jul-23	TEL035
Copper	3.0	0.2	µg/L	13-Jul-23	TEL035
Iron	363	5	µg/L	13-Jul-23	TEL035
Lead	0.3	0.1	µg/L	13-Jul-23	TEL035
Manganese	121	0.1	µg/L	13-Jul-23	TEL035
Mercury	0.02	0.01	µg/L	13-Jul-23	TEL035
Nickel	0.9	0.1	µg/L	13-Jul-23	TEL035
Zinc	3.2	0.4	µg/L	13-Jul-23	TEL035

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Taiga Batch No.: 231011

- CERTIFICATE OF ANALYSIS -

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

Taiga Batch No.: 231512

- FINAL REPORT -

Prepared For: Hamlet of Kugaaruk

Address: Box 205
Kugaaruk, NU, X0B 1K0

Attn: **Chantal Dowden** **Facsimile:** **867-769-6069**

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.
- Results are based on the specific tests at the time of analysis, does not represent the conditions during sampling and relates only to the items tested.

ReportDate: November 3, 2023
Print Date: *November 3, 2023*

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

Taiga Batch No.: 231512

- CERTIFICATE OF ANALYSIS -

Client Sample ID: PEL-4 **Taiga Sample ID:** 001

Client Project:
Sample Type: Sewage Effluent
Received Date: 13-Oct-23
Sampling Date: 11-Oct-23

Sampling Time: 9:30

Location: Kugaaruk Sewage and Solid Waste

Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	18.7	0.1	mg/L	17-Oct-23	TEL035	
Hardness	84.2	0.7	mg/L	17-Oct-23	TEL035	
Magnesium	9.1	0.1	mg/L	17-Oct-23	TEL035	
Potassium	19.0	0.1	mg/L	17-Oct-23	TEL035	
Sodium	47.6	0.1	mg/L	17-Oct-23	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	60.7	0.005	mg/L	16-Oct-23	TEL068	
Biochemical Oxygen Demand	81	2	mg/L	13-Oct-23	TEL019	
CBOD	81	2	mg/L	13-Oct-23	TEL019	
Organic Carbon, Total	76.0	0.5	mg/L	29-Oct-23	TEL033	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	301	0.4	mg/L	13-Oct-23	TEL060	

ReportDate: November 3, 2023
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Conductivity, Specific (@25C)	863	0.4	µS/cm	13-Oct-23	TEL059
pH	7.47		pH units	13-Oct-23	TEL058

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Taiga Batch No.: 231512

- CERTIFICATE OF ANALYSIS -

Client Sample ID: PEL-4 **Taiga Sample ID:** 001

Solids, Total Suspended	219	3	mg/L	17-Oct-23	TEL008
Major Ions					
Chloride	65.4	0.7	mg/L	14-Oct-23	TEL055
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	14-Oct-23	TEL055
Sulphate	1	1	mg/L	14-Oct-23	TEL055
Microbiology					
Coliforms, Fecal	1020000	10000	CFU/100mL	13-Oct-23	TEL017
Organics					
Oil and Grease, visible	Non-visible			13-Oct-23	Visual Exam
Subcontracted Organics					
Phenols, Total	< 0.0010	0.001	mg/L	17-Oct-23	AB ENV.06537
Trace Metals, Total					
Aluminum	270	0.6	µg/L	20-Oct-23	TEL035
Arsenic	1.4	0.2	µg/L	20-Oct-23	TEL035
Cadmium	0.15	0.04	µg/L	20-Oct-23	TEL035
Chromium	0.9	0.1	µg/L	20-Oct-23	TEL035
Cobalt	1.2	0.1	µg/L	20-Oct-23	TEL035
Copper	74.3	0.2	µg/L	20-Oct-23	TEL035
Iron	1120	5	µg/L	20-Oct-23	TEL035
Lead	2.3	0.1	µg/L	20-Oct-23	TEL035
Manganese	193	0.1	µg/L	20-Oct-23	TEL035
Mercury	0.03	0.01	µg/L	20-Oct-23	TEL035
Nickel	3.3	0.1	µg/L	20-Oct-23	TEL035
Zinc	60.5	0.4	µg/L	20-Oct-23	TEL035

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Taiga Batch No.: 231512

- CERTIFICATE OF ANALYSIS -

Client Sample ID: PEL-6 **Taiga Sample ID:** 002

Client Project:
Sample Type: Solid Waste Site Run-off
Received Date: 13-Oct-23
Sampling Date: 11-Oct-23

Sampling Time: 9:30

Location: Kugaaruk Sewage and Solid Waste
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	160	0.1	mg/L	17-Oct-23	TEL035	
Hardness	444	0.7	mg/L	17-Oct-23	TEL035	
Magnesium	10.9	0.1	mg/L	17-Oct-23	TEL035	
Potassium	13.2	0.1	mg/L	17-Oct-23	TEL035	
Sodium	42.5	0.1	mg/L	17-Oct-23	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	2.56	0.005	mg/L	16-Oct-23	TEL068	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	208	0.4	mg/L	13-Oct-23	TEL060	
Conductivity, Specific (@25C)	1050	0.4	µS/cm	13-Oct-23	TEL059	
pH	7.25		pH units	13-Oct-23	TEL058	
Solids, Total Suspended	14	3	mg/L	17-Oct-23	TEL008	
Major Ions						
Chloride	32.5	0.7	mg/L	16-Oct-23	TEL055	
Nitrate+Nitrite as Nitrogen	0.34	0.01	mg/L	16-Oct-23	TEL055	
Sulphate	326	1	mg/L	16-Oct-23	TEL055	

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Taiga Batch No.: 231512

- CERTIFICATE OF ANALYSIS -

Client Sample ID: PEL-6 **Taiga Sample ID:** 002

Microbiology					
Coliforms, Fecal		1	CFU/100mL		TEL017
Organics					
F2: C10-C16	< 0.2	0.2	mg/L	24-Oct-23	TEL077
F3: C16-C34	< 0.2	0.2	mg/L	24-Oct-23	TEL077
F4: C34-C50	< 0.2	0.2	mg/L	24-Oct-23	TEL077
Hydrocarbons, Total Extractable	< 0.2	0.2	mg/L	24-Oct-23	TEL077
Oil and Grease, visible	Non-visible			13-Oct-23	Visual Exam
Subcontracted Organics					
1-methylnaphthalene	< 0.010	0.01	µg/L	24-Oct-23	EPA3510
2-methylnaphthalene	< 0.010	0.01	µg/L	24-Oct-23	EPA3510
Acenaphthene	< 0.010	0.01	ug/L	24-Oct-23	EPA3510
Acenaphthylene	< 0.010	0.01	ug/L	24-Oct-23	EPA3510
Acridine	< 0.010	0.01	ug/L	24-Oct-23	EPA3510
Anthracene	< 0.010	0.01	ug/L	24-Oct-23	EPA3510
Benzene	< 0.00050	0.0005	mg/L	19-Oct-23	EPA 5021
Benzo(a)anthracene	< 0.010	0.01	µg/L	24-Oct-23	EPA3510
Benzo(a)pyrene	< 0.0050	0.005	ug/L	24-Oct-23	EPA3510
Benzo(b+j+k)fluoranthene	< 0.015	0.015	µg/L	24-Oct-23	EPA3510
Benzo(bj)fluoranthene	< 0.010	0.01	ug/L	24-Oct-23	EPA3510
Benzo(g,h,i)perylene	< 0.010	0.01	ug/L	24-Oct-23	EPA3510
Benzo(k)fluoranthene	< 0.010	0.01	ug/L	24-Oct-23	EPA3510
Chrysene	< 0.010	0.01	µg/L	24-Oct-23	EPA3510
Dibenzo(a,h)anthracene	< 0.0050	0.005	µg/L	24-Oct-23	EPA3510
Ethylbenzene	< 0.00050	0.0005	mg/L	19-Oct-23	EPA 5021

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ReportDate: November 3, 2023
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Taiga Batch No.: 231512

- CERTIFICATE OF ANALYSIS -

Client Sample ID: PEL-6 **Taiga Sample ID:** 002

F1: C6-C10	< 0.10	0.1	mg/L	19-Oct-23	CCME CWS PHC
Fluoranthene	< 0.010	0.01	µg/L	24-Oct-23	EPA3510
Fluorene	< 0.010	0.01	ug/L	24-Oct-23	EPA3510
Indeno(1,2,3-cd)pyrene	< 0.010	0.01	µg/L	24-Oct-23	EPA3510
Naphthalene	< 0.050	0.05	µg/L	24-Oct-23	EPA3510
Phenanthrene	< 0.020	0.02	µg/L	24-Oct-23	EPA3510
Phenols, Total	0.3650	0.001	mg/L	17-Oct-23	AB ENV.06537
Pyrene	< 0.010	0.01	µg/L	24-Oct-23	EPA3510
Quinoline	< 0.050	0.05	µg/L	24-Oct-23	EPA3510
Toluene	< 0.00050	0.0005	mg/L	19-Oct-23	EPA 5021
Xylenes	< 0.00050	0.0005	mg/L	19-Oct-23	EPA 5021
Trace Metals, Total					
Aluminum	238	0.6	µg/L	20-Oct-23	TEL035
Arsenic	0.6	0.2	µg/L	20-Oct-23	TEL035
Cadmium	0.18	0.04	µg/L	20-Oct-23	TEL035
Chromium	0.9	0.1	µg/L	20-Oct-23	TEL035
Cobalt	2.6	0.1	µg/L	20-Oct-23	TEL035
Copper	19.1	0.2	µg/L	20-Oct-23	TEL035
Iron	2220	5	µg/L	20-Oct-23	TEL035
Lead	1.7	0.1	µg/L	20-Oct-23	TEL035
Manganese	1070	0.1	µg/L	20-Oct-23	TEL035
Mercury	< 0.01	0.01	µg/L	20-Oct-23	TEL035
Nickel	7.4	0.1	µg/L	20-Oct-23	TEL035
Zinc	282	0.4	µg/L	20-Oct-23	TEL035

ReportDate: November 3, 2023
Print Date: *November 3, 2023*

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

Taiga Batch No.: 231512

- CERTIFICATE OF ANALYSIS -

Client Sample ID: PEL-6 **Taiga Sample ID:** 002

- DATA QUALIFERS -

Data Qualifier Descriptions:

16 *Test requested but no sample bottle received*

*** 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: November 3, 2023

Print Date: *November 3, 2023*

Appendix C: Hazardous Materials Spill Database, Kugaaruk 2023

There were no spills associated with licensed infrastructure in 2023.

Appendix D: Kugaaruk 2023 Sampling Summary

Parameter	Unit	PEL-3-2	PEL-4	
		July 6	July 6	Oct 11
Ammonia Nitrogen	mg/L	13.0	5.68	60.7
Calcium	mg/L	12.0	40.2	18.7
CBOD	mg/L	42	11	81
Chloride	mg/L	21.1		65.4
Conductivity	µS/cm	253	4190	863
Faecal Coliforms	CFU/100m	<10	9	1020000
Magnesium	mg/L	3.6	81.0	9.1
Nitrate-Nitrite	mg/L			
Oil and Grease	Visibility	Non-Visible	Non-Visible	Non-Visible
pH	pH	8.60	7.34	7.47
Potassium	mg/L	6.8	29.2	19.0
Sodium	mg/L	16.4	663	47.6
Sulphate	mg/L	6.51	133	1
Total Manganese	µg/L	42.8	121	193
Total Alkalinity	mg/L	86.6	55.5	301
Total Aluminum	µg/L	96.7	215	270
Total Arsenic	µg/L	0.5	0.8	1.4
Total Cadmium	µg/L	<0.04	<0.04	0.15
Total Chromium	µg/L	0.2	0.4	0.9
Total Cobalt	µg/L	0.4	0.4	1.2
Total Copper	µg/L	12.5	3.0	74.3
Total Hardness	mg/L	45.0	433	84.2
Total Iron	µg/L	314	363	1120
Total Lead	µg/L	0.4	0.3	2.3
Total Mercury	µg/L	0.02	0.02	0.03
Total Nickel	µg/L	-	0.9	3.3
Total Organic Carbon	mg/L	18.1	9.3	76.0
Total Phenols	mg/L	0.0049	<0.0010	<0.0010
Total Zinc	µg/L	11.8	3.2	60.5
TSS	mg/L	66	32	219

Parameter	Unit	PEL-6
		Oct 11
Ammonia Nitrogen	mg/L	2.56
Calcium	mg/L	160
Conductivity	µS/cm	1050
Magnesium	mg/L	10.9
Nitrate-Nitrite	mg/L	0.34
Oil and Grease	Visibility	Non-Visible
pH	pH	7.25
Potassium	mg/L	13.2
Sodium	mg/L	42.5
Sulphate	mg/L	326
Total Alkalinity	mg/L	208
Total Arsenic	µg/L	0.6
Total Cadmium	µg/L	0.18
Total Chromium	µg/L	0.9
Total Copper	µg/L	19.1
Total Hardness	mg/L	444
Total Iron	µg/L	2220
Total Lead	µg/L	1.7
Total Mercury	µg/L	<0.01
Total Nickel	µg/L	7.4
Total Phenols	mg/L	0.3650
TSS	mg/L	14
F1:C6-10	mg/L	<0.10
PAH		-
Benzene	µg/L	<0.00050
Toluene	µg/L	<0.00050
Ethylbenzene	µg/L	<0.00050
Xylene	µg/L	<0.00050

Appendix E: CIRNAC Inspection Report

The 2023 CIRNAC Inspection took place May 24, 2023. CIRNAC Inspector Jonathan Mesher and Hamlet Employee George Kakkianniun were in attendance. 2023 CIRNAC inspection reports were not received nor posted to the NWB public registry.

Appendix G: Receipt of Submissions to NWB

Building Nunavut Together
Nunavuliuqatigiingniq
Bâtir le Nunavut ensemble

Jonathan Mesher
Resource Management Officer
Crown-Indigenous Relations and Northern Affairs
Jonathan.Mesher@Canada.ca
September 12, 2023

RE: 3BM-PEL1929 Kugaaruk Sewage Lagoon Discharge

Dear Jonathan,

This letter is notification of discharge directly from the sewage trucks to the secondary effluent berm on the north side of the sewage lagoon. The discharge will commence September 13th, 2023.

Last summer, tears in the lagoon liner were repaired. This summer, after the melt, the Hamlet reported the lagoon levels were low. A possible tear is suspected however not confirmed. Lower lagoon levels are needed to further determine. The lagoon needs to be lowered at a quicker rate in order for consultants to assess before the end of the summer season. The Hamlet has employed a second pump and will temporarily divert the additional volume of sewage to the effluent berm. This is the same process used when emptying the lagoon for liner repairs last summer. Additional monitoring at PEL-4 will be completed to monitor any changes in the treatment process.

Please do not hesitate to contact me with any questions or concerns.

Regards,

Madeline Cole
Municipal Technical Officer
Government of Nunavut
Community and Government Services
Phone: 867-983-4134
Email: mcole1@gov.nu.ca

Appendix F: Photos of incidents requiring Maintenance

2023 Liner Whale Backs

2023 Liner Whale Backs

2023 Liner bubbles- west side of the lagoon

2023 Liner Bubbles - West Side

2023 Liner Bubbles - West Side

2023 Liner Bubbles - West Side

2023 Liner Bubbles - West Side

2023 Liner Bubbles - West Side south of vent