ANNUAL REPORT
FOR THE MUNICIPALITY OF KUGLUKTUK

YEAR BEING REPORTED: 2024

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water License No. 3BM-KUG2030 issued to the Municipality of Kugluktuk.

a) **Tabular summaries of all data generated under the "Monitoring Program";**
b) **The daily, monthly and annual quantities in cubic metres of fresh Water obtained at the Water Supply Facility and/or for all purposes under the licence;**
c) **The monthly and annual quantities in cubic metres of sewage Waste discharged; and the monthly and yearly quantities of every type of 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 (m^3)	Quantity of Sewage Waste Discharged (Estimated, m^3)
January	5,790,482	Same
February	5,668,704	Same
March	6,112,480.7	Same
April	5,437,491.2	Same
May	5,650,226.8	Same
June	5,315,319.4	Same
July	5,249,488	Same
August	5,547,899.3	Same
September	5,671,608.6	Same
October	6,040,646.8	Same
November	5,301,590.9	Same
December	5,649,744.8	Same
ANNUAL TOTAL	67,435,682.5	**Same**

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

d) Summary of modifications and/or major maintenance work carried out on the Water Supply Facility and Waste Disposal Facilities, including all associated structures;

- There were no modifications and/or major maintenance work carried out on the Water or Waste Disposal Facilities in 2024.

e) A list of unauthorized discharges and summary of follow-up action taken;20

- There were no spills associated with licensed infrastructure in 2024.

f) 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 2024.

g) 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;

- There was no Addendum with updates or revisions for manuals and plans in 2024.

h) 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;

- A contract to develop issue-for-tender drawings for the repairs on the 2014 water intake lines was awarded in October 2021. The drawings were submitted to NWB for review February 2023. It is considered a modification therefore once construction in complete an updated Water Supply O&M Plan will be submitted to NWB with stamped as-built drawing. Construction is anticipated to begin summer 2025.

i) A summary of any inspections completed by federal or territorial authorities, geotechnical or municipal engineers, on undertakings related to Waste disposal, Water use or reclamation activites;

- The CIRNAC Inspection took place on September 19th, 2024. CIRNAC Inspector James Bolt and Municipal employees Shaun Cummins and Matthew Hokanak were present.

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

- A planning project has been approved for 24-25 to develop a business case to determine if a rehab or relocation of the lagoon is the correct approach. Planning phase will commence in summer 2025.

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ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

- KUG-3A is the compliance point for this license, which represents partially treated effluent at the outlet of the lagoon. KUG-4 at the outfall of the wetland treatment area is a more appropriate compliance point since it represents fully treated effluent.
- Samples at KUG-4 are below the recommended Nunavut technology based effluent parameters of CBOD/TSS 100/120 mg/L for all samples.
- The TSS and Fecal limit at KUG-3 were exceeded in early July. Samples were taken closely following snowmelt and as such were not representative of treatment. Decant began late August after monitoring results were within required parameters.
- Samples were taken from a potential leak site on the northeast side of the lagoon. See Certificate of Analysis for results. See Appendix F for photo.
- Samples at KUG-5 were not taken as there was no run-off to sample

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FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

- KUG-5 – monitoring parameter TSS is inappropriate for contaminated land sampling. This parameter will be requested to be removed from the license in the next amendment.

- As per the 2024 CIRNAC Inspection, 'Erosion caused by truck discharging into lagoon. Section 3.5 Point #5 of the Sewage treatment facility Operation and maintenance plan states: "The discharge flume/spillways to the sewage lagoon shall be inspected for damage or displacement monthly, and repaired as necessary. The vehicle stop bollards located between the truck pad and discharge spillway are particularly important."'.

  The erosion at the truck discharge site is not unilaterally imparted, suggesting either a more dynamic force or multiple sources. Possibly related to progressive slumping and increased sites of leaks noted by the Inspector. A Planning project has been approved to develop a business case to determine if rehab or relocation of the lagoon is the correct approach. The two-year planning project is anticipated to begin summer 2025. Further updates are anticipated to be provided in the 2026 Annual Report. Additional photos of the erosion are included in Appendix G.

- As per the 2024 CIRNAC inspection, 'No Flow metre attached to the decanting line. Part H Item #4 "The Licensee shall measure and record in cubic metres, the monthly and annual quantities of effluent discharge from monitoring program station KUG-3"'.

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

- As per the 2024 CIRNAC inspection, 'Propane and other hazardous material stored improperly, including waste fuels and white wastes in the bulky metal facility. Part D, Item #11 of the issued water license states: "The Licensee shall segregate and store all hazardous materials and or hazardous waste within the 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."

  The Municipality plans to have hazardous waste stored in double containment by July 2, 2025.

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LIST OF APPENDICES:

Appendix A: KUG-3 and KUG-5 Effluent Quality Limits

3BM-KUG2030 Kugluktuk Monitoring Program Results 2024 for Effluent Quality

Parameter	Maximum Concentration of Any Grab Sample	KUG-3		
		July 8	August 19	Sept 18
CBOD	120 mg/L	39	74	49
Total Suspended	180 mg/L	130	76	116
Fecal Coliforms	$1x10^6$ CFU/100mL	1.77×10^6	8×10^5	1.27×10^5
Oil + Grease	No visible sheen	Non-visible	Non-Visible	Non-Visible
pH	between 6 and 9	7.98	7.85	8.00

Parameter	Maximum concentration of Any Grab Sample	KUG-5
		No Flow
pH	between 6 and 9	-
Total Suspended	15 mg/L	-
Oil + Grease	5 mg/L and no visible sheen	-
Lead (Dissolved)	0.001 mg/L	-
Phenols	0.02 mg/L	-
Benzene	0.370 mg/L	-
Toluene	0.002 mg/L	-
Ethyl-benzene	0.09 mg/L	-

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.: 240845

- FINAL REPORT -

Prepared For: Hamlet of Kugluktuk

Address: P.O. Box 271
Kugluktuk, NU,X0B 0E0

Attn: SAO **Facsimile:** 867-982-3060

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: July 12, 2024
Print Date: *July 12, 2024*

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

Taiga Batch No.: 240845

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Potential Leak **Taiga Sample ID:** 001

Client Project:
Sample Type: Sewage
Received Date: 25-Jun-24
Sampling Date: 24-Jun-24
Sampling Time:
Location:

Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Inorganics - Nutrients						
Ammonia as Nitrogen	64.2	0.21	mg/L	28-Jun-24	TEL068	210
Biochemical Oxygen Demand	49	2	mg/L	25-Jun-24	TEL019	
CBOD	51	2	mg/L	25-Jun-24	TEL019	
Organic Carbon, Dissolved	124	0.5	mg/L	04-Jul-24	TEL033	
Organic Carbon, Total	127	0.5	mg/L	04-Jul-24	TEL033	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	482	0.4	mg/L	25-Jun-24	TEL060	
Conductivity, Specific (@25C)	2040	0.4	µS/cm	25-Jun-24	TEL059	
pH	7.39		pH units	25-Jun-24	TEL058	
Solids, Total Dissolved	968	10	mg/L	26-Jun-24	TEL009	
Solids, Total Suspended	76	3	mg/L	26-Jun-24	TEL008	
Major Ions						

ReportDate: July 12, 2024
Print Date: *July 12, 2024*

Chloride	330	7.7	mg/L	29-Jun-24	TEL055	210	233
Fluoride	< 0.1	0.1	mg/L	29-Jun-24	TEL055		233

ReportDate: July 12, 2024
Print Date: *July 12, 2024*

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

Taiga Batch No.: 240845

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Potential Leak **Taiga Sample ID:** 001

Nitrate+Nitrite as Nitrogen	0.03	0.01	mg/L	29-Jun-24	TEL055	233
Sulphate	24	1	mg/L	29-Jun-24	TEL055	233
Microbiology						
Coliforms, Fecal	1,000	10	CFU/100mL	25-Jun-24	TEL017	210
Trace Metals, Dissolved						
Aluminum	8.9	0.6	µg/L	02-Jul-24	TEL035	
Iron	183	5	ug/L	02-Jul-24	TEL035	
Manganese	2140	0.1	µg/L	02-Jul-24	TEL035	
Nickel	11.7	0.1	µg/L	02-Jul-24	TEL035	
Selenium	1.3	0.3	µg/L	02-Jul-24	TEL035	
Zinc	0.6	0.4	µg/L	02-Jul-24	TEL035	
Trace Metals, Total						
Aluminum	1470	0.6	µg/L	02-Jul-24	TEL035	
Iron	18000	5	µg/L	02-Jul-24	TEL035	
Manganese	2430	0.1	µg/L	02-Jul-24	TEL035	
Nickel	14.1	0.1	µg/L	02-Jul-24	TEL035	
Selenium	1.2	0.3	µg/L	02-Jul-24	TEL035	
Zinc	26.7	0.4	µg/L	02-Jul-24	TEL035	

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Taiga Batch No.: 240845

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Potential Leak **Taiga Sample ID:** 001

- DATA QUALIFERS -

Data Qualifier Descriptions:

210 *Detection limit adjusted for required dilution.*

233 *Equipment failure; sample analyzed past hold time.*

*** 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.: 241049

- FINAL REPORT -

Prepared For: Hamlet of Kugluktuk

Address: P.O. Box 271
Kugluktuk, NU,X0B 0E0

Attn: SAO **Facsimile: 867-982-3060**

Final report has been reviewed and approved by:

Shalene Manickum
Laboratory Manager

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: Tuesday, July 30, 2024
Print Date: *Tuesday, July 30, 2024*

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

Taiga Batch No.: 241049

- CERTIFICATE OF ANALYSIS -

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

Client Project:
Sample Type: Sewage Effluent
Received Date: 19-Jul-24
Sampling Date: 18-Jul-24

Sampling Time: 10:00
Location: Kugluktuk Sewage System
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	12.6	0.1	mg/L	22-Jul-24	TEL035	
Hardness	57.2	0.7	mg/L	22-Jul-24	TEL035	
Magnesium	6.3	0.1	mg/L	22-Jul-24	TEL035	
Potassium	15.7	0.1	mg/L	22-Jul-24	TEL035	
Sodium	37.3	0.1	mg/L	22-Jul-24	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	25.4	0.105	mg/L	22-Jul-24	TEL068	210
Biochemical Oxygen Demand	32	2	mg/L	19-Jul-24	TEL019	
CBOD	39	2	mg/L	19-Jul-24	TEL019	
Organic Carbon, Total	34.1	0.5	mg/L	26-Jul-24	TEL033	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	161	0.4	mg/L	20-Jul-24	TEL060	

ReportDate: Tuesday, July 30, 2024
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Conductivity, Specific (@25C)	553	0.4	µS/cm	20-Jul-24	TEL059
pH	7.98		pH units	20-Jul-24	TEL058

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Taiga Batch No.: 241049

- CERTIFICATE OF ANALYSIS -

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

Solids, Total Suspended	130	3	mg/L	23-Jul-24	TEL008	
Major Ions						
Chloride	46.6	0.7	mg/L	20-Jul-24	TEL055	
Nitrate+Nitrite as Nitrogen	0.09	0.01	mg/L	20-Jul-24	TEL055	
Sulphate	12	1	mg/L	20-Jul-24	TEL055	
Microbiology						
Coliforms, Fecal	1770000	10000	CFU/100mL	19-Jul-24	TEL017	3, 210
Organics						
Oil and Grease, visible	Non-visible			19-Jul-24	Visual Exam	
Trace Metals, Total						
Aluminum	80.6	0.6	µg/L	26-Jul-24	TEL035	
Arsenic	0.5	0.2	µg/L	26-Jul-24	TEL035	
Cadmium	< 0.04	0.04	µg/L	26-Jul-24	TEL035	
Chromium	0.5	0.1	µg/L	26-Jul-24	TEL035	
Cobalt	0.4	0.1	µg/L	26-Jul-24	TEL035	
Copper	35.0	0.2	µg/L	26-Jul-24	TEL035	
Iron	273	5	µg/L	26-Jul-24	TEL035	
Lead	0.2	0.1	µg/L	26-Jul-24	TEL035	
Manganese	35.7	0.1	µg/L	26-Jul-24	TEL035	
Nickel	1.6	0.1	µg/L	26-Jul-24	TEL035	
Zinc	24.8	0.4	µg/L	26-Jul-24	TEL035	

ReportDate: Tuesday, July 30, 2024
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Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.: 241049

- CERTIFICATE OF ANALYSIS -

Client Sample ID: KUG-2 **Taiga Sample ID:** 002

Client Project:
Sample Type: Solid Waste Effluent
Received Date: 19-Jul-24
Sampling Date: 18-Jul-24

Sampling Time: 10:00
Location: Kugluktuk Sewage System
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	81.5	0.1	mg/L	22-Jul-24	TEL035	
Hardness	352	0.7	mg/L	22-Jul-24	TEL035	
Magnesium	36.2	0.1	mg/L	22-Jul-24	TEL035	
Potassium	5.3	0.1	mg/L	22-Jul-24	TEL035	
Sodium	50.2	0.1	mg/L	22-Jul-24	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	0.012	0.005	mg/L	22-Jul-24	TEL068	
Biochemical Oxygen Demand	5	2	mg/L	19-Jul-24	TEL019	81
CBOD	5	2	mg/L	19-Jul-24	TEL019	
Organic Carbon, Total	19.7	0.5	mg/L	26-Jul-24	TEL033	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	157	0.4	mg/L	20-Jul-24	TEL060	
Conductivity, Specific (@25C)	896	0.4	µS/cm	20-Jul-24	TEL059	
pH	8.23		pH units	20-Jul-24	TEL058	

ReportDate: Tuesday, July 30, 2024
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Taiga Environmental Laboratory
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Tel: (867)-767-9235 Fax:(867)-920-8740

Taiga Batch No.:
241049

Solids, Total Suspended 4 3 mg/L 23-Jul-24 TEL008

Major Ions

- CERTIFICATE OF ANALYSIS -

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

Taiga Batch No.: 241049

- CERTIFICATE OF ANALYSIS -

Client Sample ID: KUG-2 **Taiga Sample ID:** 002

Chloride	130	1.4	mg/L	20-Jul-24	TEL055	210
Nitrate+Nitrite as Nitrogen	0.11	0.01	mg/L	20-Jul-24	TEL055	
Sulphate	97	1	mg/L	20-Jul-24	TEL055	
Microbiology						
Coliforms, Fecal	14	1	CFU/100mL	19-Jul-24	TEL017	3
Organics						
Oil and Grease, visible	Non-visible			19-Jul-24	Visual Exam	
Trace Metals, Total						
Aluminum	119	0.6	µg/L	26-Jul-24	TEL035	
Arsenic	0.9	0.2	µg/L	26-Jul-24	TEL035	
Cadmium	0.07	0.04	µg/L	26-Jul-24	TEL035	
Chromium	0.4	0.1	µg/L	26-Jul-24	TEL035	
Cobalt	0.3	0.1	µg/L	26-Jul-24	TEL035	
Copper	5.6	0.2	µg/L	26-Jul-24	TEL035	
Iron	440	5	µg/L	26-Jul-24	TEL035	
Lead	0.4	0.1	µg/L	26-Jul-24	TEL035	
Manganese	96.7	0.1	µg/L	26-Jul-24	TEL035	
Nickel	2.6	0.1	µg/L	26-Jul-24	TEL035	
Zinc	123	0.4	µg/L	26-Jul-24	TEL035	

ReportDate: Tuesday, July 30, 2024
Print Date: *Tuesday, July 30, 2024*

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

Taiga Batch No.: 241049

- CERTIFICATE OF ANALYSIS -

Client Sample ID: SL-Leak **Taiga Sample ID:** 003

Client Project:
Sample Type: Water
Received Date: 19-Jul-24
Sampling Date: 18-Jul-24

Sampling Time: 10:00
Location: Kugluktuk Sewage System
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	42.8	0.1	mg/L	22-Jul-24	TEL035	
Hardness	252	0.7	mg/L	22-Jul-24	TEL035	
Magnesium	35.3	0.1	mg/L	22-Jul-24	TEL035	
Potassium	22.4	0.1	mg/L	22-Jul-24	TEL035	
Sodium	168	0.1	mg/L	22-Jul-24	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	58.0	0.21	mg/L	22-Jul-24	TEL068	210
Biochemical Oxygen Demand	37	2	mg/L	19-Jul-24	TEL019	
CBOD	40	2	mg/L	19-Jul-24	TEL019	
Organic Carbon, Total	41.0	0.5	mg/L	26-Jul-24	TEL033	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	405	0.4	mg/L	20-Jul-24	TEL060	
Conductivity, Specific (@25C)	1760	0.4	µS/cm	20-Jul-24	TEL059	
pH	7.84		pH units	20-Jul-24	TEL058	

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

Taiga Batch No.:
241049

Solids, Total Suspended 63 3 mg/L 23-Jul-24 TEL008

Major Ions

- 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.: 241049

- CERTIFICATE OF ANALYSIS -

Client Sample ID: SL-Leak **Taiga Sample ID:** 003

Chloride	271	7.7	mg/L	20-Jul-24	TEL055	210
Nitrate+Nitrite as Nitrogen	< 0.01	0.01	mg/L	20-Jul-24	TEL055	
Sulphate	16	1	mg/L	20-Jul-24	TEL055	
Microbiology						
Coliforms, Fecal	1430	10	CFU/100mL	19-Jul-24	TEL017	3, 210
Organics						
Oil and Grease, visible	Non-visible			19-Jul-24	Visual Exam	
Trace Metals, Total						
Aluminum	261	0.6	µg/L	26-Jul-24	TEL035	
Arsenic	9.6	0.2	µg/L	26-Jul-24	TEL035	
Cadmium	< 0.04	0.04	µg/L	26-Jul-24	TEL035	
Chromium	2.2	0.1	µg/L	26-Jul-24	TEL035	
Cobalt	2.2	0.1	µg/L	26-Jul-24	TEL035	
Copper	14.0	0.2	µg/L	26-Jul-24	TEL035	
Iron	10800	5	µg/L	26-Jul-24	TEL035	
Lead	1.7	0.1	µg/L	26-Jul-24	TEL035	
Manganese	1810	0.1	µg/L	26-Jul-24	TEL035	
Nickel	11.1	0.1	µg/L	26-Jul-24	TEL035	
Zinc	5.2	0.4	µg/L	26-Jul-24	TEL035	

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

Taiga Batch No.: 241049

- CERTIFICATE OF ANALYSIS -

Client Sample ID: SL-Leak **Taiga Sample ID:** 003

- DATA QUALIFERS -

Data Qualifier Descriptions:

210	*Detection limit adjusted for required dilution.*
3	*Holding time exceeded before receipt of sample*
81	*Results are inconclusive due to insufficient depletion of sample, minimum 2 mg/L required over 5 days.*

*** 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

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

Taiga Batch No.: 241260

- FINAL REPORT -

Prepared For: Hamlet of Kugluktuk

Address: P.O. Box 271
Kugluktuk, NU,X0B 0E0

Attn: SAO **Facsimile:** 867-982-3060

Final report has been reviewed and approved by:

Shalene Manickum
Laboratory Manager

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, August 28, 2024
Print Date: *Wednesday, August 28, 2024*

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

Taiga Batch No.: 241260

- CERTIFICATE OF ANALYSIS -

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

Client Project:
Sample Type: Sewage Effluent
Received Date: 20-Aug-24
Sampling Date: 19-Aug-24

Sampling Time: 14:30
Location: Kugluktuk Sewage System
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	14.7	0.1	mg/L	23-Aug-24	TEL035	
Hardness	64.6	0.7	mg/L	23-Aug-24	TEL035	
Magnesium	6.8	0.1	mg/L	23-Aug-24	TEL035	
Potassium	17.7	0.1	mg/L	23-Aug-24	TEL035	
Sodium	41.9	0.1	mg/L	23-Aug-24	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	23.1	0.105	mg/L	27-Aug-24	TEL068	210
Biochemical Oxygen Demand	76	2	mg/L	20-Aug-24	TEL019	
CBOD	74	2	mg/L	20-Aug-24	TEL019	
Organic Carbon, Total	56.6	0.5	mg/L	22-Aug-24	TEL033	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	163	0.4	mg/L	20-Aug-24	TEL060	

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Conductivity, Specific (@25C)	588	0.4	µS/cm	20-Aug-24	TEL059
pH	7.85		pH units	20-Aug-24	TEL058

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Taiga Batch No.: 241260

- CERTIFICATE OF ANALYSIS -

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

Solids, Total Suspended	76	3	mg/L	23-Aug-24	TEL008	
Major Ions						
Chloride	54.8	0.7	mg/L	21-Aug-24	TEL055	
Nitrate+Nitrite as Nitrogen	0.21	0.01	mg/L	21-Aug-24	TEL055	
Sulphate	14	1	mg/L	21-Aug-24	TEL055	
Microbiology						
Coliforms, Fecal	800000	10000	CFU/100mL	20-Aug-24	TEL017	210
Organics						
Oil and Grease, visible	Non-visible			20-Aug-24	Visual Exam	
Trace Metals, Total						
Aluminum	99.8	0.6	µg/L	26-Aug-24	TEL035	
Arsenic	0.5	0.2	µg/L	26-Aug-24	TEL035	
Cadmium	< 0.04	0.04	µg/L	26-Aug-24	TEL035	
Chromium	0.4	0.1	µg/L	26-Aug-24	TEL035	
Cobalt	0.4	0.1	µg/L	26-Aug-24	TEL035	
Copper	28.2	0.2	µg/L	26-Aug-24	TEL035	
Iron	260	5	µg/L	26-Aug-24	TEL035	
Lead	0.3	0.1	µg/L	26-Aug-24	TEL035	
Manganese	37.5	0.1	µg/L	26-Aug-24	TEL035	
Mercury	0.06	0.01	µg/L	26-Aug-24	TEL035	
Nickel	1.6	0.1	µg/L	26-Aug-24	TEL035	
Zinc	26.5	0.4	µg/L	26-Aug-24	TEL035	

ReportDate: Wednesday, August 28, 2024
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Taiga Batch No.: 241260

- CERTIFICATE OF ANALYSIS -

Client Sample ID: KUG-2 **Taiga Sample ID:** 002

Client Project:
Sample Type: Solid Waste Effluent
Received Date: 20-Aug-24
Sampling Date: 19-Aug-24

Sampling Time: 14:30
Location: Kugluktuk Sewage System
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	80.5	0.1	mg/L	23-Aug-24	TEL035	
Hardness	378	0.7	mg/L	23-Aug-24	TEL035	
Magnesium	43.2	0.1	mg/L	23-Aug-24	TEL035	
Potassium	4.9	0.1	mg/L	23-Aug-24	TEL035	
Sodium	101	0.1	mg/L	23-Aug-24	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	0.021	0.005	mg/L	27-Aug-24	TEL068	
Biochemical Oxygen Demand	3	2	mg/L	20-Aug-24	TEL019	
CBOD	3	2	mg/L	20-Aug-24	TEL019	
Organic Carbon, Total	16.0	0.5	mg/L	22-Aug-24	TEL033	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	196	0.4	mg/L	20-Aug-24	TEL060	
Conductivity, Specific (@25C)	1230	0.4	µS/cm	20-Aug-24	TEL059	
pH	8.33		pH units	20-Aug-24	TEL058	

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Taiga Batch No.:
241260

Solids, Total Suspended < 3 3 mg/L 23-Aug-24 TEL008

Major Ions

- CERTIFICATE OF ANALYSIS -

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

Taiga Batch No.: 241260

- CERTIFICATE OF ANALYSIS -

Client Sample ID: KUG-2 **Taiga Sample ID:** 002

Chloride	230	4.2	mg/L	21-Aug-24	TEL055	210
Nitrate+Nitrite as Nitrogen	0.04	0.01	mg/L	21-Aug-24	TEL055	
Sulphate	83	1	mg/L	21-Aug-24	TEL055	
Microbiology						
Coliforms, Fecal	17	1	CFU/100mL	20-Aug-24	TEL017	
Organics						
Oil and Grease, visible	Non-visible			20-Aug-24	Visual Exam	
Trace Metals, Total						
Aluminum	128	0.6	µg/L	26-Aug-24	TEL035	
Arsenic	0.9	0.2	µg/L	26-Aug-24	TEL035	
Cadmium	0.05	0.04	µg/L	26-Aug-24	TEL035	
Chromium	0.3	0.1	µg/L	26-Aug-24	TEL035	
Cobalt	0.3	0.1	µg/L	26-Aug-24	TEL035	
Copper	5.6	0.2	µg/L	26-Aug-24	TEL035	
Iron	336	5	µg/L	26-Aug-24	TEL035	
Lead	0.5	0.1	µg/L	26-Aug-24	TEL035	
Manganese	28.2	0.1	µg/L	26-Aug-24	TEL035	
Mercury	0.01	0.01	µg/L	26-Aug-24	TEL035	
Nickel	2.5	0.1	µg/L	26-Aug-24	TEL035	
Zinc	53.8	0.4	µg/L	26-Aug-24	TEL035	

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Taiga Batch No.: 241260

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Possible Leak Sewage **Taiga Sample ID:** 003

Client Project:
Sample Type: Water
Received Date: 20-Aug-24
Sampling Date: 19-Aug-24

Sampling Time: 14:30
Location: Kugluktuk Sewage System
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	94.4	0.1	mg/L	23-Aug-24	TEL035	
Hardness	572	0.7	mg/L	23-Aug-24	TEL035	
Magnesium	81.8	0.1	mg/L	23-Aug-24	TEL035	
Potassium	26.7	0.1	mg/L	23-Aug-24	TEL035	
Sodium	440	0.1	mg/L	23-Aug-24	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	46.4	0.21	mg/L	27-Aug-24	TEL068	210
Biochemical Oxygen Demand	15	2	mg/L	20-Aug-24	TEL019	
CBOD	13	2	mg/L	20-Aug-24	TEL019	
Organic Carbon, Total	35.1	0.5	mg/L	22-Aug-24	TEL033	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	492	0.4	mg/L	20-Aug-24	TEL060	
Conductivity, Specific (@25C)	3770	0.4	µS/cm	20-Aug-24	TEL059	
pH	7.96		pH units	20-Aug-24	TEL058	

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Taiga Batch No.:
241260

Solids, Total Suspended 40 3 mg/L 23-Aug-24 TEL008

Major Ions

- CERTIFICATE OF ANALYSIS -

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Taiga Batch No.: 241260

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Possible Leak Sewage **Taiga Sample ID:** 003

Chloride	896	7.7	mg/L	21-Aug-24	TEL055	210
Nitrate+Nitrite as Nitrogen	0.55	0.01	mg/L	21-Aug-24	TEL055	
Sulphate	59	1	mg/L	21-Aug-24	TEL055	
Microbiology						
Coliforms, Fecal	172	4	CFU/100mL	20-Aug-24	TEL017	210
Organics						
Oil and Grease, visible	Non-visible			20-Aug-24	Visual Exam	
Trace Metals, Total						
Aluminum	178	3	µg/L	26-Aug-24	TEL035	210
Arsenic	8.3	1	µg/L	26-Aug-24	TEL035	210
Cadmium	< 0.20	0.2	µg/L	26-Aug-24	TEL035	210
Chromium	2.0	0.5	µg/L	26-Aug-24	TEL035	210
Cobalt	2.3	0.5	µg/L	26-Aug-24	TEL035	210
Copper	5.4	1	µg/L	26-Aug-24	TEL035	210
Iron	7390	25	µg/L	26-Aug-24	TEL035	210
Lead	0.8	0.5	µg/L	26-Aug-24	TEL035	210
Manganese	2240	0.5	µg/L	26-Aug-24	TEL035	210
Mercury	< 0.05	0.05	µg/L	26-Aug-24	TEL035	210
Nickel	11.1	0.5	µg/L	26-Aug-24	TEL035	210
Zinc	2.6	2	µg/L	26-Aug-24	TEL035	210

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Taiga Batch No.: 241260

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Possible Leak Sewage **Taiga Sample ID:** 003

- DATA QUALIFERS -

Data Qualifier Descriptions:

210 *Detection limit adjusted for required dilution.*

*** 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 Batch No.: 241466

- FINAL REPORT -

Prepared For: Hamlet of Kugluktuk

Address: P.O. Box 271
Kugluktuk, NU,X0B 0E0

Attn: SAO **Facsimile:** 867-982-3060

Final report has been reviewed and approved by:

Shalene Manickum
Laboratory Manager

NOTES:

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ReportDate: Monday, October 7, 2024
Print Date: *Monday, October 7, 2024*

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

Taiga Batch No.: 241466

- CERTIFICATE OF ANALYSIS -

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

Client Project:
Sample Type: Sewage Effluent
Received Date: 20-Sep-24
Sampling Date: 18-Sep-24

Sampling Time: 11:50
Location: Kugluktuk Sewage System
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	15.3	0.1	mg/L	24-Sep-24	TEL035	
Hardness	66.0	0.7	mg/L	24-Sep-24	TEL035	
Magnesium	6.8	0.1	mg/L	24-Sep-24	TEL035	
Potassium	18.0	0.1	mg/L	24-Sep-24	TEL035	
Sodium	43.0	0.1	mg/L	24-Sep-24	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	26.5	0.105	mg/L	25-Sep-24	TEL068	210
Biochemical Oxygen Demand	64	2	mg/L	20-Sep-24	TEL019	
CBOD	49	2	mg/L	20-Sep-24	TEL019	
Organic Carbon, Total	57.5	0.5	mg/L	06-Oct-24	TEL033	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	155	0.4	mg/L	21-Sep-24	TEL060	

ReportDate: Monday, October 7, 2024
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Conductivity, Specific (@25C)	581	0.4	µS/cm	21-Sep-24	TEL059
pH	8.00		pH units	21-Sep-24	TEL058

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Taiga Batch No.: 241466

- CERTIFICATE OF ANALYSIS -

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

Solids, Total Suspended	116	3	mg/L	25-Sep-24	TEL008	
Major Ions						
Chloride	60.3	0.7	mg/L	25-Sep-24	TEL055	
Nitrate+Nitrite as Nitrogen	0.39	0.01	mg/L	25-Sep-24	TEL055	
Sulphate	13	1	mg/L	25-Sep-24	TEL055	
Microbiology						
Coliforms, Fecal	127000	1000	CFU/100mL	20-Sep-24	TEL017	210, 3
Organics						
Oil and Grease, visible	Non-visible			20-Sep-24	Visual Exam	
Trace Metals, Total						
Aluminum	187	6	µg/L	24-Sep-24	TEL035	210
Arsenic	< 2.0	2	µg/L	24-Sep-24	TEL035	210
Cadmium	< 0.40	0.4	µg/L	24-Sep-24	TEL035	210
Chromium	< 1.0	1	µg/L	24-Sep-24	TEL035	210
Cobalt	< 1.0	1	µg/L	24-Sep-24	TEL035	210
Copper	26.2	2	µg/L	24-Sep-24	TEL035	210
Iron	437	50	µg/L	24-Sep-24	TEL035	210
Lead	< 1.0	1	µg/L	24-Sep-24	TEL035	210
Manganese	50.4	1	µg/L	24-Sep-24	TEL035	210
Mercury	< 0.10	0.1	µg/L	24-Sep-24	TEL035	210
Nickel	1.6	1	µg/L	24-Sep-24	TEL035	210
Zinc	35.0	4	µg/L	24-Sep-24	TEL035	210

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Taiga Batch No.: 241466

- CERTIFICATE OF ANALYSIS -

Client Sample ID: KUG-2 **Taiga Sample ID:** 002

Client Project:
Sample Type: Solid Waste Effluent
Received Date: 20-Sep-24
Sampling Date: 18-Sep-24

Sampling Time: 11:50
Location: Kugluktuk Sewage System
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	109	0.1	mg/L	24-Sep-24	TEL035	
Hardness	549	0.7	mg/L	24-Sep-24	TEL035	
Magnesium	67.4	0.1	mg/L	24-Sep-24	TEL035	
Potassium	6.6	0.1	mg/L	24-Sep-24	TEL035	
Sodium	167	0.1	mg/L	24-Sep-24	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	0.047	0.005	mg/L	25-Sep-24	TEL068	
Biochemical Oxygen Demand	3	2	mg/L	20-Sep-24	TEL019	
CBOD	4	2	mg/L	20-Sep-24	TEL019	
Organic Carbon, Total	15.8	0.5	mg/L	06-Oct-24	TEL033	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	251	0.4	mg/L	21-Sep-24	TEL060	
Conductivity, Specific (@25C)	1950	0.4	µS/cm	21-Sep-24	TEL059	
pH	8.29		pH units	21-Sep-24	TEL058	

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Taiga Batch No.:
241466

Solids, Total Suspended 12 3 mg/L 25-Sep-24 TEL008

Major Ions

- CERTIFICATE OF ANALYSIS -

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Taiga Batch No.: 241466

- CERTIFICATE OF ANALYSIS -

Client Sample ID: KUG-2 **Taiga Sample ID:** 002

Chloride	432	7.7	mg/L	25-Sep-24	TEL055	210
Nitrate+Nitrite as Nitrogen	0.06	0.01	mg/L	25-Sep-24	TEL055	
Sulphate	102	1	mg/L	25-Sep-24	TEL055	
Microbiology						
Coliforms, Fecal	14	2	CFU/100mL	20-Sep-24	TEL017	210, 3
Organics						
Oil and Grease, visible	Non-visible			20-Sep-24	Visual Exam	
Trace Metals, Total						
Aluminum	283	0.6	µg/L	24-Sep-24	TEL035	
Arsenic	0.9	0.2	µg/L	24-Sep-24	TEL035	
Cadmium	< 0.04	0.04	µg/L	24-Sep-24	TEL035	
Chromium	0.6	0.1	µg/L	24-Sep-24	TEL035	
Cobalt	0.4	0.1	µg/L	24-Sep-24	TEL035	
Copper	5.0	0.2	µg/L	24-Sep-24	TEL035	
Iron	472	5	µg/L	24-Sep-24	TEL035	
Lead	0.4	0.1	µg/L	24-Sep-24	TEL035	
Manganese	110	0.1	µg/L	24-Sep-24	TEL035	
Mercury	0.02	0.01	µg/L	24-Sep-24	TEL035	
Nickel	2.7	0.1	µg/L	24-Sep-24	TEL035	
Zinc	69.5	0.4	µg/L	24-Sep-24	TEL035	

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Taiga Batch No.: 241466

- CERTIFICATE OF ANALYSIS -

Client Sample ID: KUG-4 **Taiga Sample ID:** 003

Client Project:
Sample Type: Sewage Effluent
Received Date: 20-Sep-24
Sampling Date: 18-Sep-24

Sampling Time: 11:50
Location: Kugluktuk Sewage System
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	33.7	0.1	mg/L	24-Sep-24	TEL035	
Hardness	215	0.7	mg/L	24-Sep-24	TEL035	
Magnesium	31.9	0.1	mg/L	24-Sep-24	TEL035	
Potassium	13.8	0.1	mg/L	24-Sep-24	TEL035	
Sodium	152	0.1	mg/L	24-Sep-24	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	10.3	0.055	mg/L	25-Sep-24	TEL068	210
Biochemical Oxygen Demand	24	2	mg/L	20-Sep-24	TEL019	
CBOD	13	2	mg/L	20-Sep-24	TEL019	
Organic Carbon, Total	33.6	0.5	mg/L	06-Oct-24	TEL033	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	146	0.4	mg/L	21-Sep-24	TEL060	
Conductivity, Specific (@25C)	1370	0.4	µS/cm	21-Sep-24	TEL059	
pH	8.09		pH units	21-Sep-24	TEL058	

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Taiga Batch No.:
241466

Solids, Total Suspended	31	3	mg/L	25-Sep-24	TEL008

Major Ions

- CERTIFICATE OF ANALYSIS -

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Taiga Batch No.: 241466

- CERTIFICATE OF ANALYSIS -

Client Sample ID: KUG-4 **Taiga Sample ID:** 003

Chloride	312	7.7	mg/L	25-Sep-24	TEL055	210
Nitrate+Nitrite as Nitrogen	3.20	0.01	mg/L	25-Sep-24	TEL055	
Sulphate	46	1	mg/L	25-Sep-24	TEL055	
Microbiology						
Coliforms, Fecal	11800	100	CFU/100mL	20-Sep-24	TEL017	210, 3
Organics						
Oil and Grease, visible	Non-visible			20-Sep-24	Visual Exam	
Trace Metals, Total						
Aluminum	242	6	µg/L	24-Sep-24	TEL035	210
Arsenic	< 2.0	2	µg/L	24-Sep-24	TEL035	210
Cadmium	< 0.40	0.4	µg/L	24-Sep-24	TEL035	210
Chromium	< 1.0	1	µg/L	24-Sep-24	TEL035	210
Cobalt	1.4	1	µg/L	24-Sep-24	TEL035	210
Copper	9.7	2	µg/L	24-Sep-24	TEL035	210
Iron	2140	50	µg/L	24-Sep-24	TEL035	210
Lead	1.4	1	µg/L	24-Sep-24	TEL035	210
Manganese	762	1	µg/L	24-Sep-24	TEL035	210
Mercury	< 0.10	0.1	µg/L	24-Sep-24	TEL035	210
Nickel	4.0	1	µg/L	24-Sep-24	TEL035	210
Zinc	5.4	4	µg/L	24-Sep-24	TEL035	210

ReportDate: Monday, October 7, 2024
Print Date: *Monday, October 7, 2024*

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

Taiga Batch No.: 241466

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Possible Leak **Taiga Sample ID:** 004

Client Project:
Sample Type: Water
Received Date: 20-Sep-24
Sampling Date: 18-Sep-24

Sampling Time: 11:50
Location: Kugluktuk Sewage System
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	70.5	0.1	mg/L	24-Sep-24	TEL035	
Hardness	415	0.7	mg/L	24-Sep-24	TEL035	
Magnesium	58.3	0.1	mg/L	24-Sep-24	TEL035	
Potassium	26.3	0.1	mg/L	24-Sep-24	TEL035	
Sodium	280	0.1	mg/L	24-Sep-24	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	61.8	0.105	mg/L	25-Sep-24	TEL068	210
Biochemical Oxygen Demand	17	2	mg/L	20-Sep-24	TEL019	
CBOD	18	2	mg/L	20-Sep-24	TEL019	
Organic Carbon, Total	34.4	0.5	mg/L	06-Oct-24	TEL033	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	519	0.4	mg/L	21-Sep-24	TEL060	
Conductivity, Specific (@25C)	2740	0.4	µS/cm	21-Sep-24	TEL059	
pH	8.03		pH units	21-Sep-24	TEL058	

ReportDate: Monday, October 7, 2024
Print Date: *Monday, October 7, 2024*

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

Taiga Batch No.:
241466

Solids, Total Suspended 48 3 mg/L 25-Sep-24 TEL008

Major Ions

- 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.: 241466

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Possible Leak **Taiga Sample ID:** 004

Chloride	554	7.7	mg/L	25-Sep-24	TEL055	210
Nitrate+Nitrite as Nitrogen	0.64	0.01	mg/L	25-Sep-24	TEL055	
Sulphate	40	1	mg/L	25-Sep-24	TEL055	
Microbiology						
Coliforms, Fecal	49	1	CFU/100mL	20-Sep-24	TEL017	3
Organics						
Oil and Grease, visible	Non-visible			20-Sep-24	Visual Exam	
Trace Metals, Total						
Aluminum	152	6	µg/L	24-Sep-24	TEL035	210
Arsenic	9.9	2	µg/L	24-Sep-24	TEL035	210
Cadmium	< 0.40	0.4	µg/L	24-Sep-24	TEL035	210
Chromium	2.5	1	µg/L	24-Sep-24	TEL035	210
Cobalt	2.4	1	µg/L	24-Sep-24	TEL035	210
Copper	5.3	2	µg/L	24-Sep-24	TEL035	210
Iron	12100	50	µg/L	24-Sep-24	TEL035	210
Lead	1.1	1	µg/L	24-Sep-24	TEL035	210
Manganese	2120	1	µg/L	24-Sep-24	TEL035	210
Mercury	< 0.10	0.1	µg/L	24-Sep-24	TEL035	210
Nickel	10.2	1	µg/L	24-Sep-24	TEL035	210
Zinc	< 4.0	4	µg/L	24-Sep-24	TEL035	210

ReportDate: Monday, October 7, 2024
Print Date: *Monday, October 7, 2024*

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

Taiga Batch No.: 241466

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Possible Leak **Taiga Sample ID:** 004

- DATA QUALIFERS -

Data Qualifier Descriptions:

210 *Detection limit adjusted for required dilution.*

3 *Holding time exceeded before receipt of sample*

*** 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: Monday, October 7, 2024

Print Date: ***Monday, October 7, 2024***

Appendix C: Hazardous Materials Spill Database, Kugluktuk 2024

There were no spills associated with licensed infrastructure in 2024.

ANNUAL REPORT
FOR THE MUNICIPALITY OF KUGLUKTUK

Appendix D: Kugluktuk 2024 Sampling Summary

		KUG-2			KUG-3			KUG-4
Parameter	Unit	July 18	August 19	September 18	July 18	August 19	September 18	September 18
CBOD	mg/L	5	3	4	39	74	49	13
TSS	mg/L	4	<3	12	130	76	116	31
Fecal Coliforms	CFU/100ml	14	17	14	1.77×10^6	0.8×10^6	0.0127×10^6	0.0118×10^6
pH	pH	8.23	8.33	8.29	7.98	7.85	8.00	8.09
Conductivity	µS/cm	896	1230	1950	553	588	581	1370
Nitrate-Nitrite	mg/L	0.11	-	0.06	0.09	0.21	-	-
Oil and Grease	Visibility	Non- Visible	Non-Visible	Non-Visible	Non-Visible	Non-Visible	Non-Visible	Non-Visible
Magnesium	mg/L	36.2	43.2	67.4	6.3	6.8	6.8	31.9
Calcium	mg/L	81.5	80.5	109	12.6	14.7	15.3	33.7
Sodium	mg/L	50.2	101	167	37.3	41.9	43.0	152
Potassium	mg/L	5.3	4.9	6.6	15.7	17.7	18.0	13.8
Chloride	mg/L	130	230	432	46.6	54.8	60.3	312
Sulphate	mg/L	97	83	102	12	14	13	46
Total Hardness	mg/L	352	378	549	57.2	64.6	66.0	215
Total Alkalinity	mg/L	157	196	251	161	163	155	146
Ammonia Nitrogen	mg/L	0.012	0.021	0.047	25.4	23.1	26.5	10.3
Total Cadmium	µg/L	0.07	0.05	<0.04	<0.04	<0.04	<0.40	<0.40
Total Cobalt	µg/L	0.3	0.3	0.4	0.4	0.4	<1.0	1.4
Total Chromium	µg/L	0.4	0.3	0.6	0.5	0.4	<1.0	<1.0
Total Copper	µg/L	5.6	5.6	5.0	35.0	28.2	26.2	9.7
Total Aluminum	µg/L	119	128	283	80.6	99.8	187	242
Total Mercury	µg/L		0.01	0.02	-	0.06	<0.10	<0.10
Total Zinc	µg/L	123	53.8	69.5	24.8	26.5	35.0	5.4
Total Iron	µg/L	440	336	472	273	260	437	2140
Total Manganese	µg/L	96.7	28.2	110	35.7	37.5	50.4	762
Total Nickel	µg/L	2.6	2.5	2.7	1.6	1.6	1.6	4.0
Total Lead	µg/L	0.4	0.5	0.4	0.2	0.3	<1.0	1.4
Total Arsenic	µg/L	0.9	0.9	0.9	0.5	0.5	<2.0	<2.0
Total Organic Carbon	mg/L	19.7	16.0	15.8	34.1	56.6	57.5	33.6

Appendix E: CIRNAC Inspection Report

The CIRNAC inspection took place on September 19, 2024. In attendance were CIRNAC Inspector James Bolt and Municipal Foremen Shaun Cummins and Matthew Hokanak.

Water Licence Inspection Report

☒Original
☐ Follow-Up Report

Licensee	Licensee Representative
Hamlet of Kugluktuk	**Shaun Cummins and Matthew Hokanak.**
License No./Expiry	**Representative's Title**
3BM-KUG2030	**Foreman**
Other Authorizations	
Activities Inspected	
☐ **Camp, Commercial** ☐ **Drilling** ☐ **Mining** ☐ **Construction** ☐ **Reclamation** ☐ **Fuel Storage** ☐ **Roads/Hauling** ☐ **Winter Hauling** ☐ **Camp, Private** ☒ **Other Community sewage, solid waste facilities.**	

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

Water Use	Condition	Comment	**Site Conditions**	Condition	Comment	**Haz/Mat Management**	Condition	Comment
Intake/Screen	NI		Water Management Structures	NI		Storage	C	
Flow Measure. Device	NI		Culverts / Bridges	NI		Spills	C	
Source:	NI		Drainage	NI		Spill Plan	NI	
Water Use:	NI		Erosion / Sediment	C				
Recirculation (y /n)	NI		Mitigation Measures	NI		**Administrative**		
			Reclamation Activities	NA		Records	NI	
			Materials Storage	C		Reports	NI	
Waste Disposal			Signage	C		Plans	NI	
Waste Water	C					Notifications	NI	
Solid Waste	C		**Monitoring**			**Other**		
Hazardous Waste	C		Sample Collection / Analysis	NI		Follow-up from previous inspection	C	

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

Samples taken by Inspector:	**Location(s):**
☐ Yes ☒ No	

Section 1 Comments

On September 19, 2024, I, Isaiah James Bolt, Inspector with the Crown Indigenous Relations and Northern Affairs Canada (CIRNAC), conducted an inspection of Kugluktuk's Sewage Lagoon, Land farm, Hazardous waste, and Metal Dump to ensure compliance against their water license.
Inspection began at 9:30am on September 19 2024. I was accompanied by Shaun Cummins (foreman-projects and fleet) and Matthew Hokanak (Foreman-water/sewage and roads) for the inspection.

1. Sewage Lagoon: At the time of inspection the lagoon had been decanted so water levels in the lagoon were a lot lower than usual. No flow meter was present on the effluent line or the pump.
2. The lagoon is still leaking product into the environment and shows signs of slumping inside the berm on the east wall close to the discharge area, -spillway of lagoon. (Photo #1 and #2) show the erosion of the berm on the inside wall close to the sewage truck discharging area. The fence shown in (Photo #1) had dropped a significant amount and is an indicator that the berm is in fact losing substantial material internally. (Photo #3) shows the slumping of material inwards into the lagoon under the liner. Discharge from the sewage trucks may not be clearing the gap between the concrete bollards and the spillway and is migrating down into the pooling area shown in (Photo #1).

3. (Photo #4) shows the decanting hose reaching out into the environment. The line is well away from any water body and is ensuring effluent can filter through the receiving environment.
4. (Photo #5) shows the water pump and the hose used to pull effluent out of the lagoon. No flow meter was attached to the pump. According to the Foremen the decanting pump ran at a rate of 80m3 an hour 29 days at 23 hours a day which equals to 53360m^3.
5. (Photo #6) Cracking/slumping of the outer east wall of the lagoon was observed. This area is known for the active leak throughout the year.
6. (Photo #7) shows the active leaking from the east wall as well as the slumping /cracking described in line 5 above.
7. (Photo # 8) shows the propane storage location. Propane bottles, 20lbs and 1 lbs bottles are shown placed on the ground amongst trash.
8. (Photo #9) shows the waste battery location. Boxes for the batteries is shown in the back ground. Batteries are placed on the ground and exposed to the elements.
9. (Photo #10) is of the "Landfarm" area. The south east corner of the solid waste facility (open burn area). This area has not been cleaned as per the inspectors request in pervious years reports and is still being used as an "hazardous waste" section. Piles of contaminated soil are present in the middle of this area. These piles are creating an obstacle which hinders the hamlets ability to access the back portion of the landfarm. This greatly reduced the available usable space of the landfarm. (Photo #11) shows the backside of these piles.
10. Waste batteries are also present inside the landfarm facility. (Photo #12)
11. (Photo #13) shows the area where the waste oil burner is located. Drums of "burnable" oil/fuel are stored near the oil burner. The oil burner has not been operational for a few years due to deterioration.
12. (Photo #14) shows "un-burnable" product such as glycol and other hazardous material stored away from the oil burner. These drums were tested and deemed unfit for burning. These barrels should be placed into the Hazardous waste section (south west side of the solid waste facility)
13. (Photo #15 and #16) The bulky metal facility was observed to have old fuel drums and white waste(fridges and freezers) mixed in with various bulky metals. Some of these used fuel drums were cut up and dismantled while others were observed to have holes poked into them and are leaking small amounts of Diesel fuel into the metal dump. The drums that are not cut up should be moved to the hazardous waste storage, dismantled drums that are shown to be clean may stay within the bulky metal facility.
14. (Photo #17) shows the ponding at the lower end of the bulky metal facility. This water is stagnant and shows no sign of migration.

Section 2 Non-Compliance

1. Erosion caused by truck discharging into lagoon. Section 3.5 Point #5 of the Sewage treatment facility Operation and maintenance plan states: "*The discharge flume/spillways to the sewage lagoon shall be inspected for damage or displacement monthly, and repaired as necessary. The vehicle stop bollards located between the truck pad and discharge spillway are particularly important.*"
2. No Flow metre attached to the decanting line. Part H Item #4 "*The Licensee shall measure and record in cubic metres, the monthly and annual quantities of effluent discharge from monitoring program station KUG-3*"
3. Propane and other hazardous material stored improperly, including waste fuels and white wastes in the bulky metal facility. Part D, Item #11 of the issued water license states: "*The Licensee shall segregate and store all hazardous materials and or hazardous waste within the 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*."

Section 3 Action Required

In regards to non-compliance issue #1: Part D Item #6 of the issued water license states: "*The sewage disposal facility shall be maintained and operated, to the satisfaction of an Inspector and in such a manner as to prevent structural failure*". Please ensure that discharged sewage is not causing erosion of the truck pad on the east side of the lagoon.
In regards to non-compliance issue #2: Part B, Item #6 of the issued water license states: "*The Licensee shall install flow metres 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 of this license*"
In regards to non-compliance issue #3: -Propane bottles stored on the ground should be placed in boxes and stored for shipment. -Batteries stored on the ground should be placed in the appropriate boxes and stored for shipment. -Hazardous waste/waste fuels stored in the Landfarm should be consolidated and placed in the appropriate hazardous waste section (South West corner of the solid waste facility). -Batteries stored in the landfarm should be consolidated with the rest of the batteries and placed in appropriate boxes and stored for shipment. -White wastes and fuel drums mixed in with bulk metals should be sorted and separated from bulky metals and placed in their appropriate areas.
Please complete all the Actions Required within 90 days and provide photos and details about the complete activities to James.bolt@rcaanc-cirnac.gc.ca

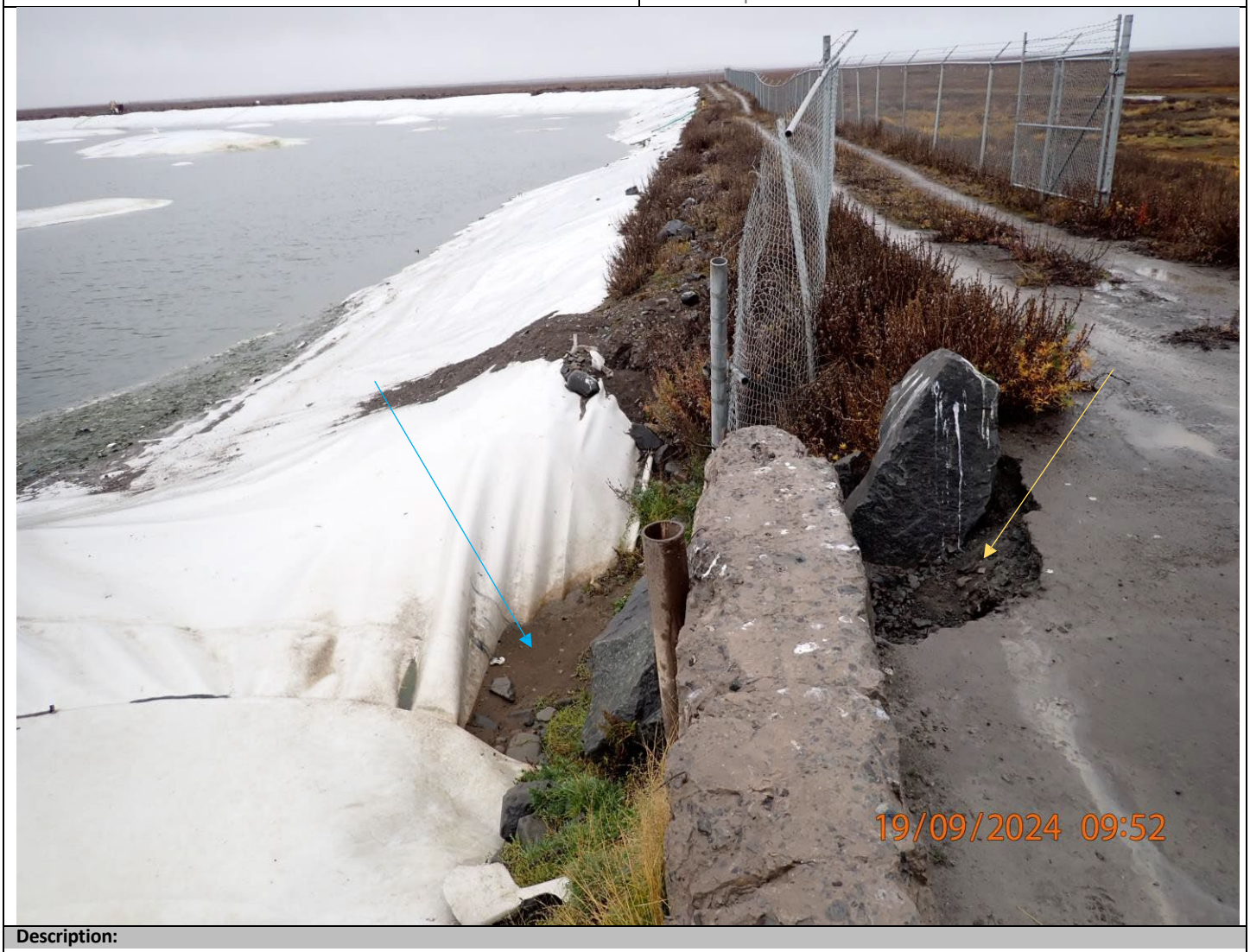
Licensee or Representative	Inspector's Name
Hamlet of Kugluktuk	Isaiah James Bolt
Signature	**Signature**
	James Bolt
Date	**Date**
	21/10/2024

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

PHOTO LOG

Date:	License Number:	Camera/Model:	Inspector
Thursday, September 19, 2024	3BM-KUG2030	Olympus Tough TG-6	Isaiah James Bolt

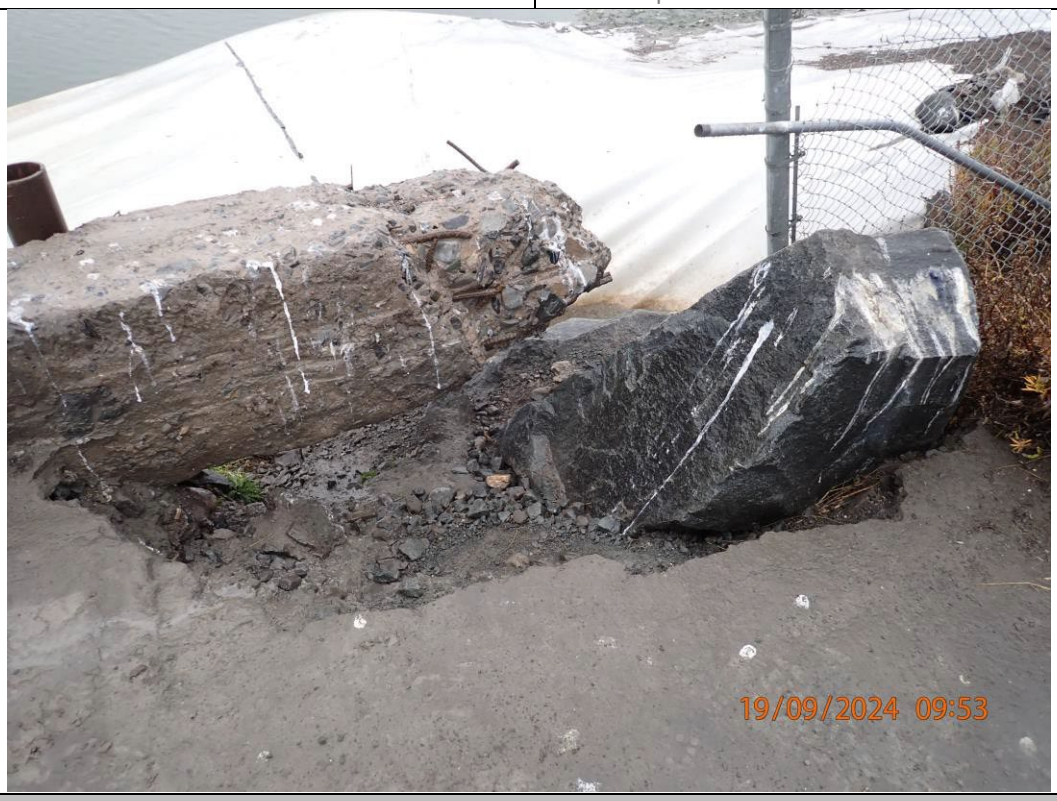
Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #1	Click or tap here to enter text.



Description:

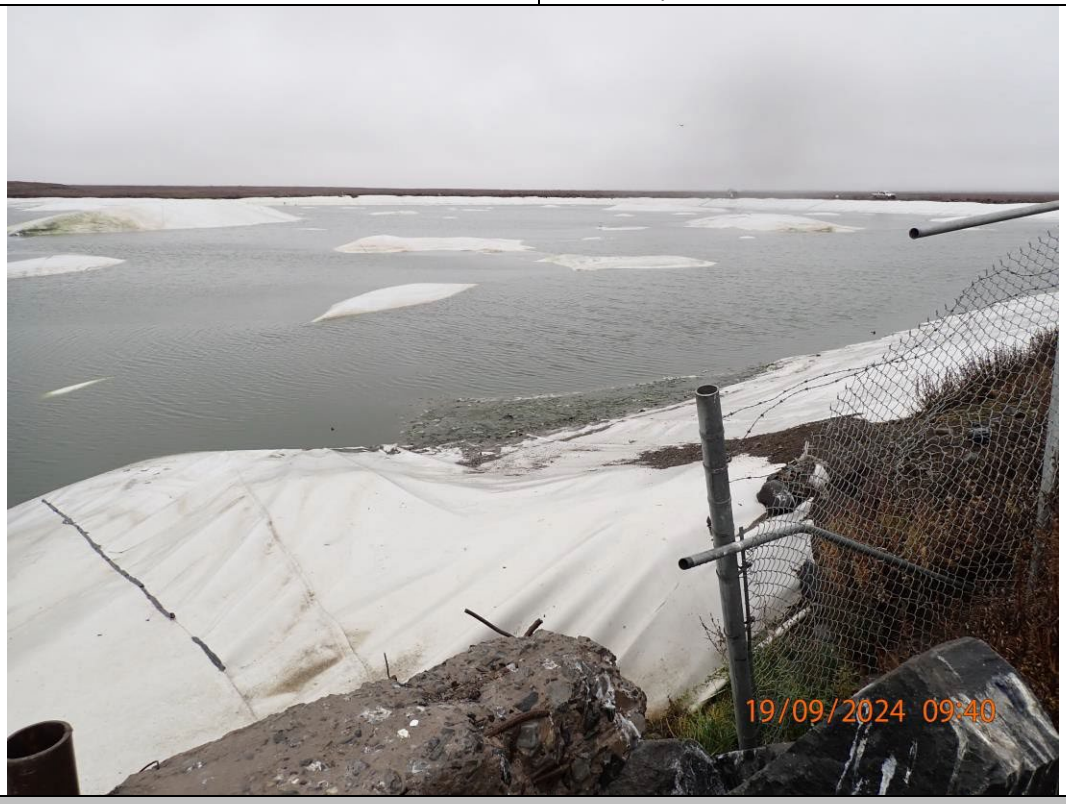
Blue Arrow shows pooling area and sedmint build up potentially caused by Sewage water that has not been able to clear the distance from the concrete block to the slope of the liner and is migrating along the bank into the pooling area. Yellow arrow shows erosion caused by this effect. The fence in the photo is also effected as this whole area is being washed out by the pooling water and migrating under the liner.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #2	Click or tap here to enter text.



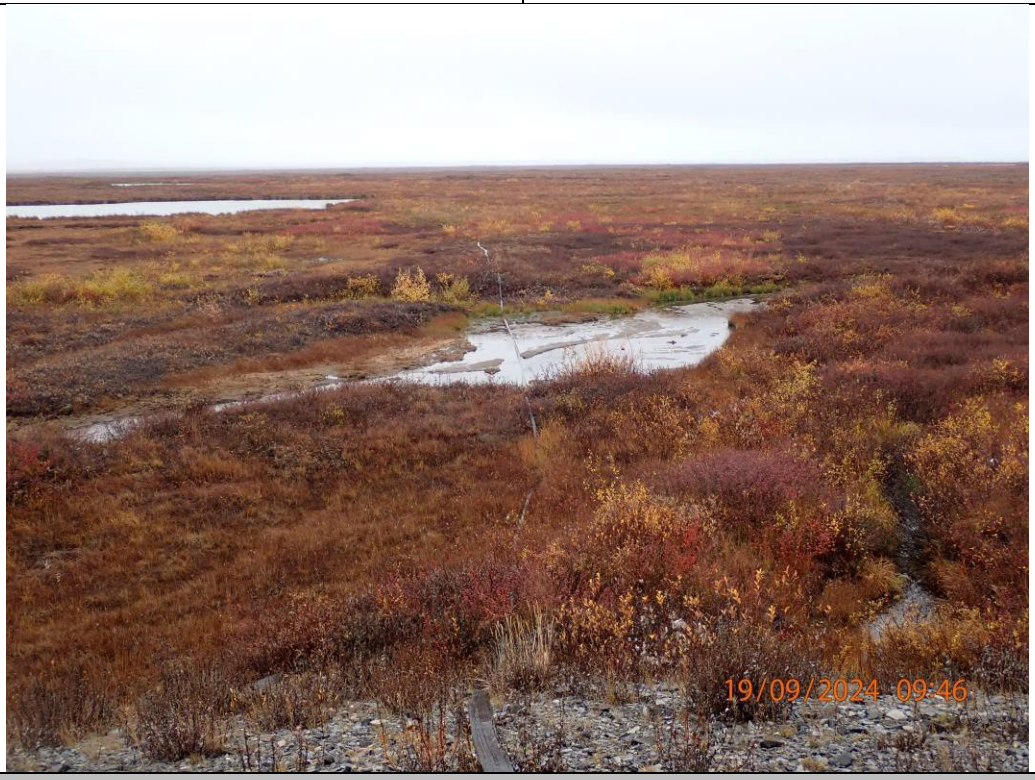
Description:
Another view of the erosion extent and the loss of berm structure under the concrete barrier.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #3	Click or tap here to enter text.



Description:
The image shows the broken and sunken fence and the “toe” caused by material slumping into the lagoon under the liner.

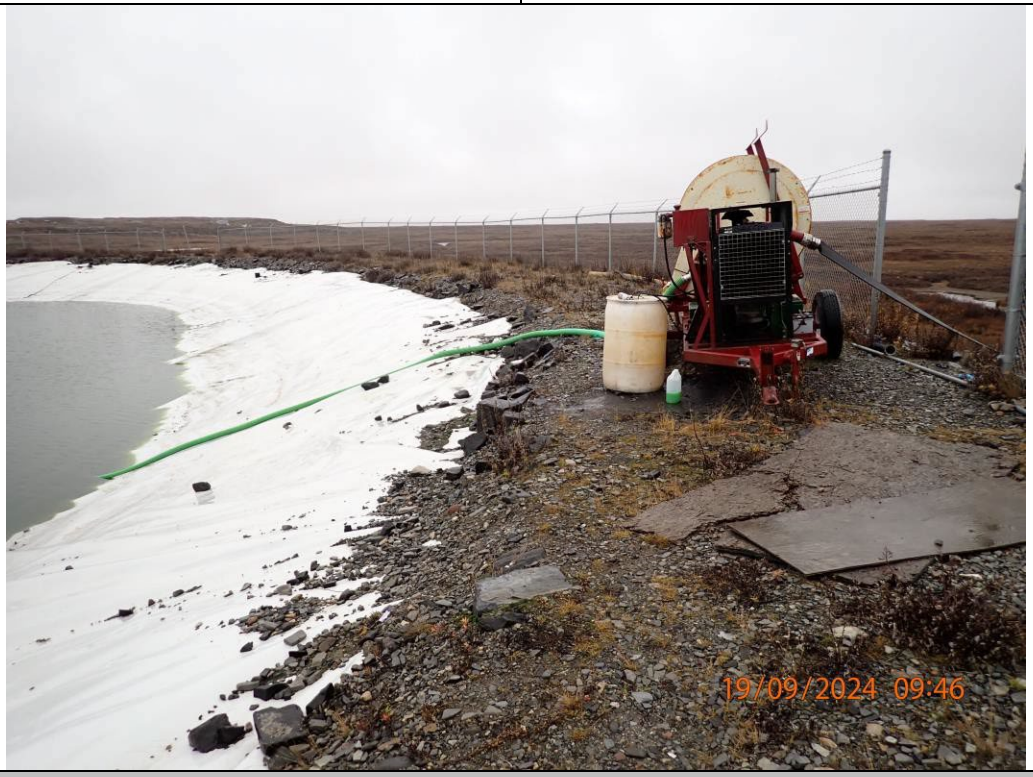
Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #4	Click or tap here to enter text.



Description:

Decanting hose is placed into the receiving environemnt far away from the lagoon. No issues noted.

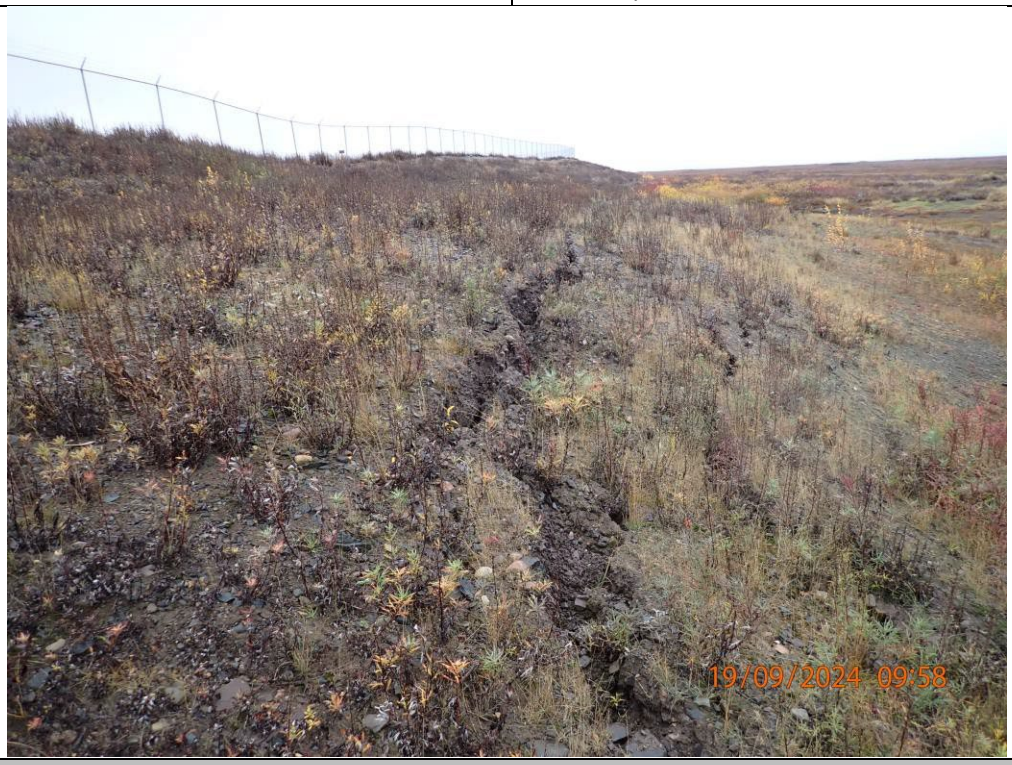
Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #5	Click or tap here to enter text.



Description:

Water pump used to decant.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #6	Click or tap here to enter text.

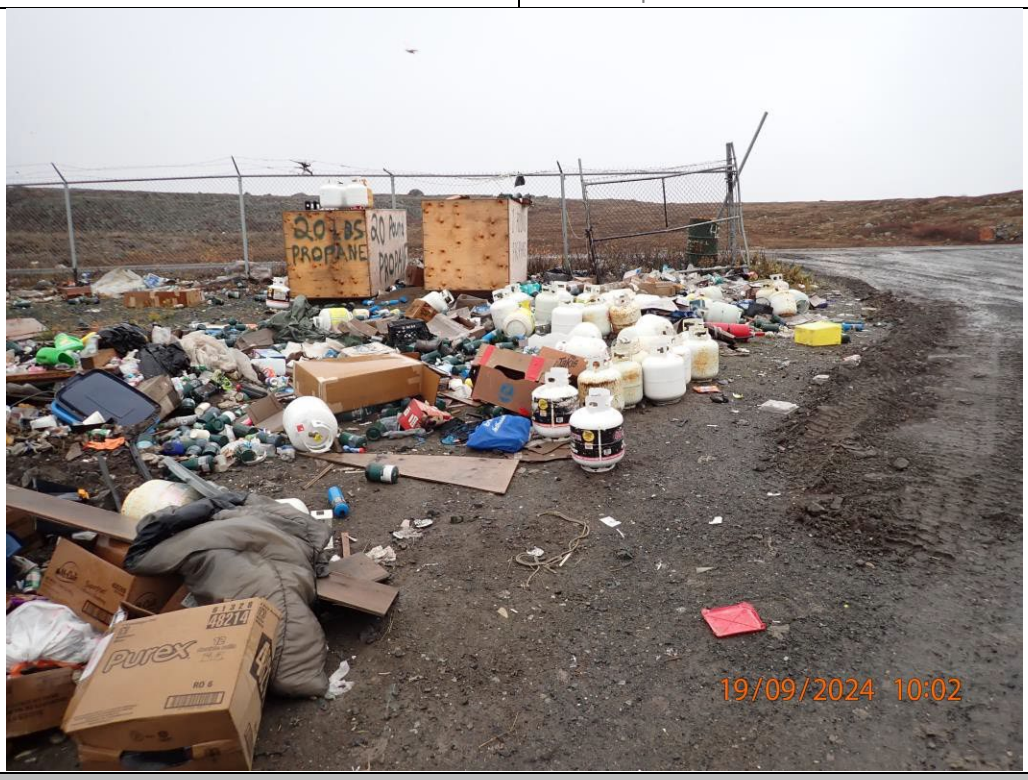


Description:
Crack on the butress on the east side of the lagoon

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #7	Click or tap here to enter text.

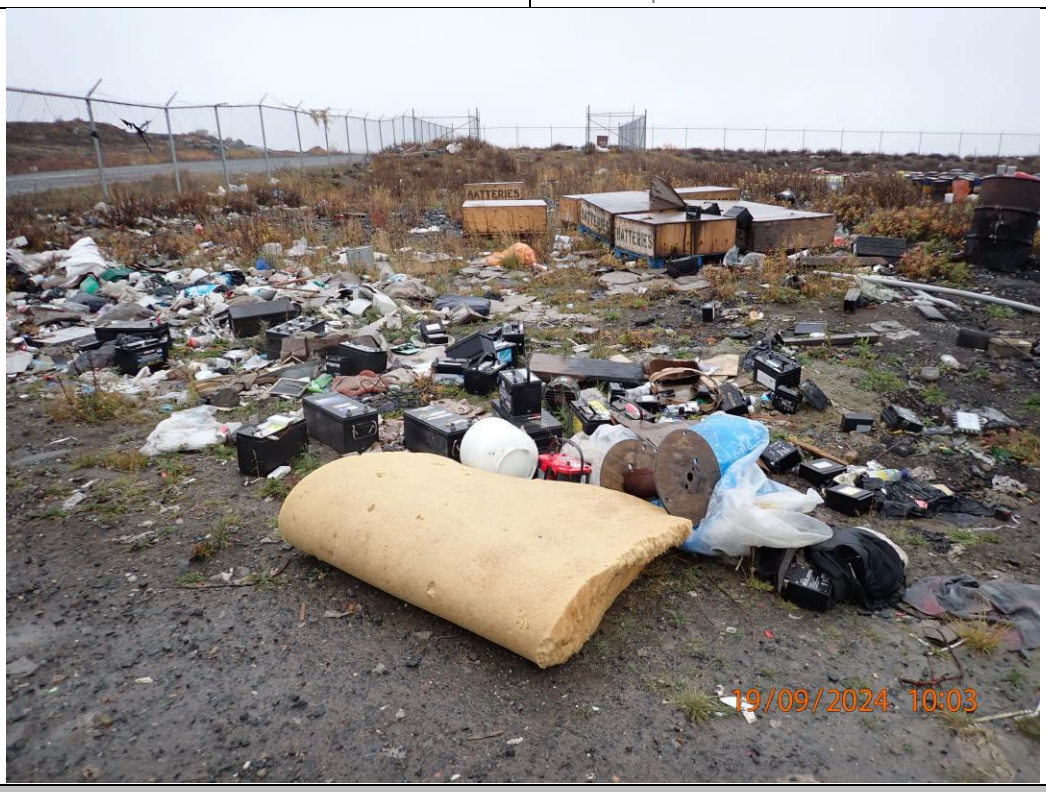
Description:
Image shows 5 locations of active leaking.(Red arrows) Each location is an area where effluent is eflitrating from the lagoon. The yellow line shows the cracking on the butress that was installed as an extra precaution to help the berm wall from slumping

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #8	Click or tap here to enter text.



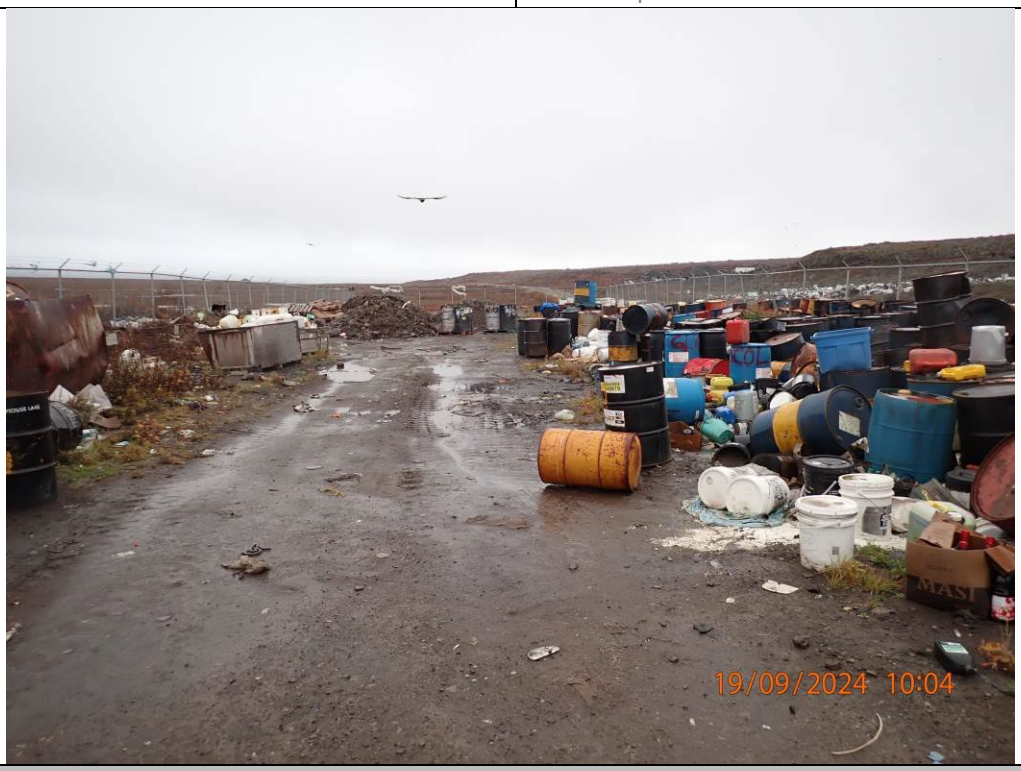
Description:
Propane bottles on the ground

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #9	Click or tap here to enter text.



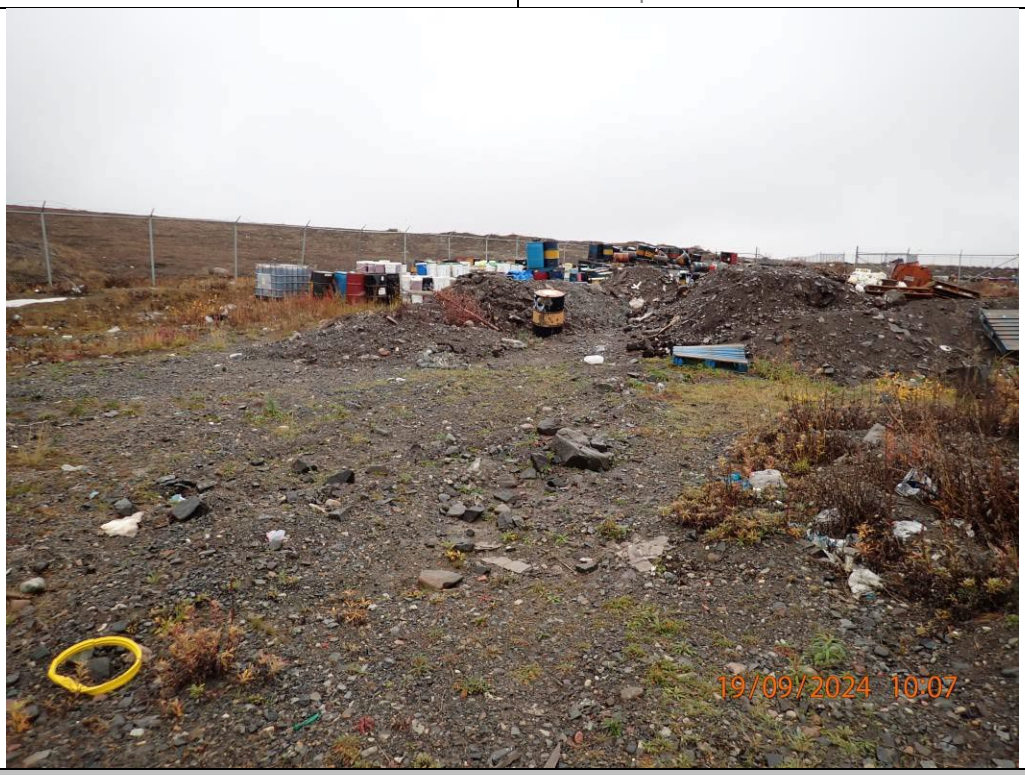
Description:
Batteries on the ground inside the solid waste facility.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #10	Click or tap here to enter text.



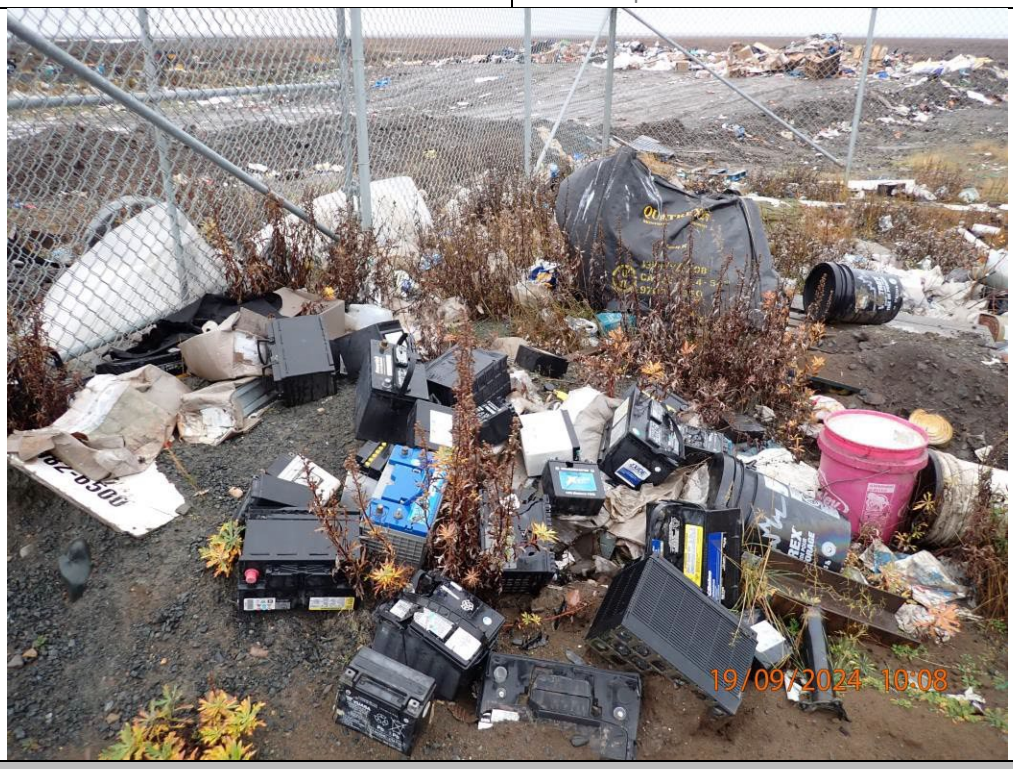
Description:
Landfarm, with various hazardous waste

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #11	Click or tap here to enter text.



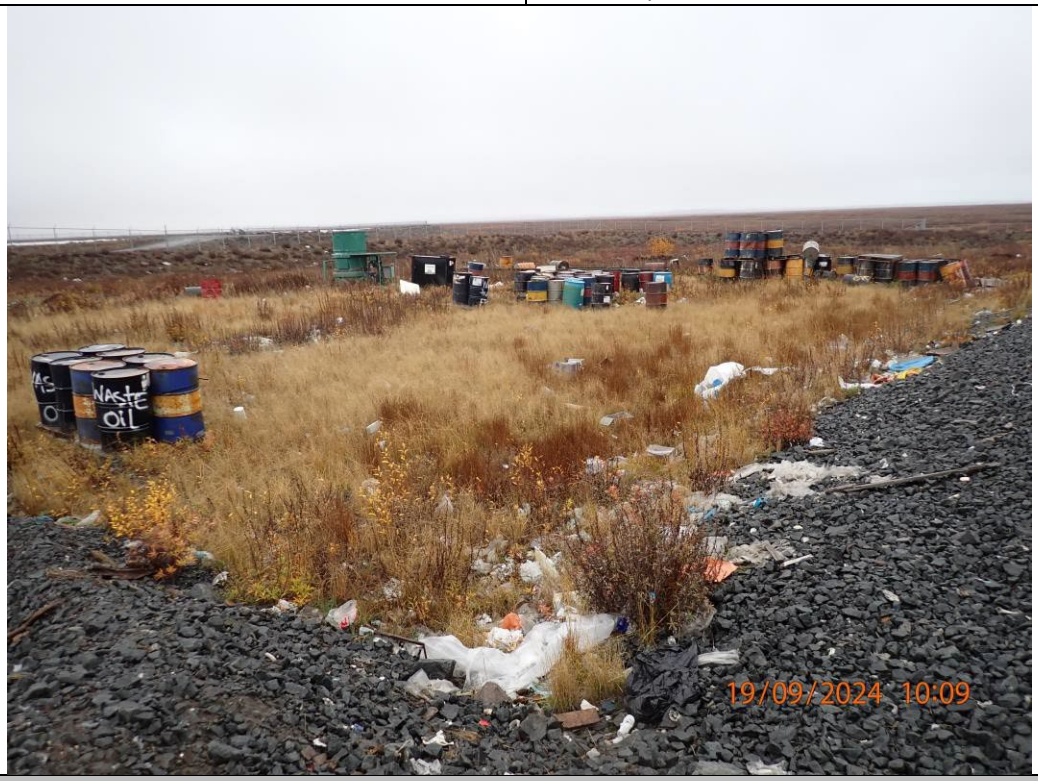
Description:
Backside of the landfarm showing contaminated soil piles blocking access.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #12	Click or tap here to enter text.



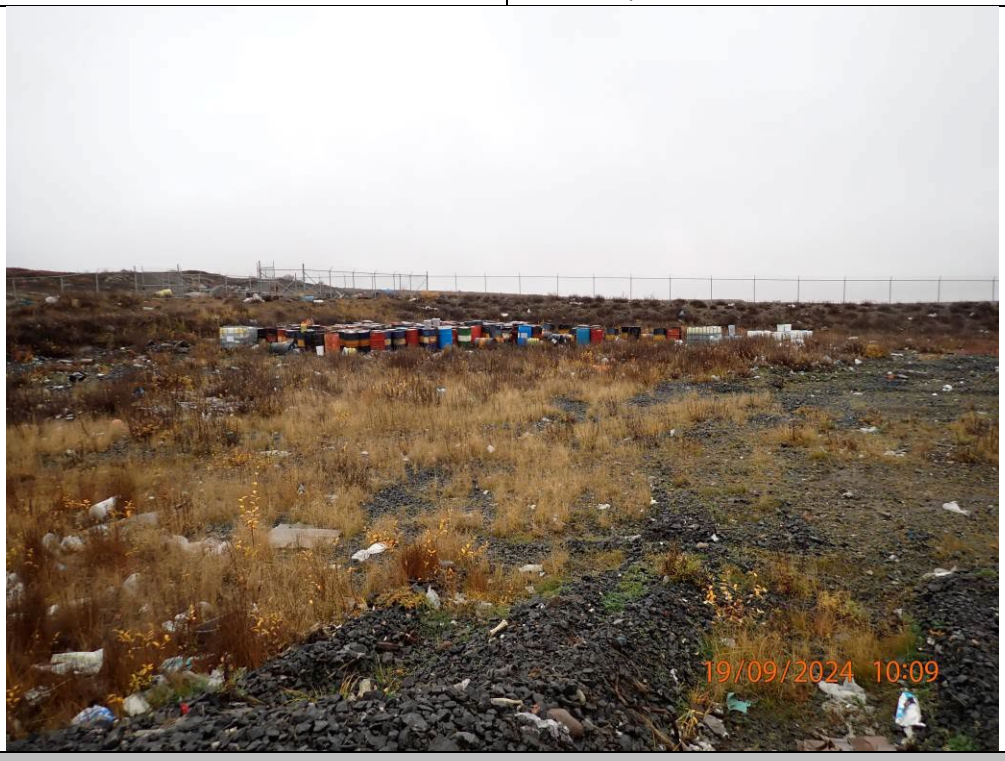
Description:
Batteries found inside the landfarm

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #13	Click or tap here to enter text.



Description:
Green oil burner shown and various drums of burnable waste.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #14	Click or tap here to enter text.



Description:
Un-burnable waste drums shown stored away from the oil burner. This product was tested and deemed unfit for burning.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #15	Click or tap here to enter text.

Description:
Used oil drums found found inside the bulk metal facility.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #16	Click or tap here to enter text.

Description:
White wastes and fuel drums amongst bulk metal

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #17	Click or tap here to enter text.

Description:
Kug 2 sample location at bulk metal facility. Showing stagnant water.

Licensee or Representative	Inspector's Name
Hamlet of Kugluktuk	Isaiah James Bolt
Signature	Signature
Date NOV 2 0 2024	Date

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

PHOTO LOG

Date:	License Number:	Camera/Model:	Inspector
Thursday, September 19, 2024	3BM-KUG2030	Olympus Tough TG-6	Isaiah James Bolt

Photo No.	Lat/Long (DD.MM.SS.SS NAD83)
Photo#l	Click or tao here to enter text.

Description:
Blue Arrow shows pooling area and sedmint build up potentially caused by Sewage water that has not been able to dear the distance from the concrete block to the slope of the liner and is migrating along the bank Into the pooling area. Yellow arrow shows erosion caused by this effect. The fence in the e'!oto is also effected as this y..hole area is being washed out by the pooling water and migrating under the liner

Canada

Appendix F: Photo of Potential Leak Site

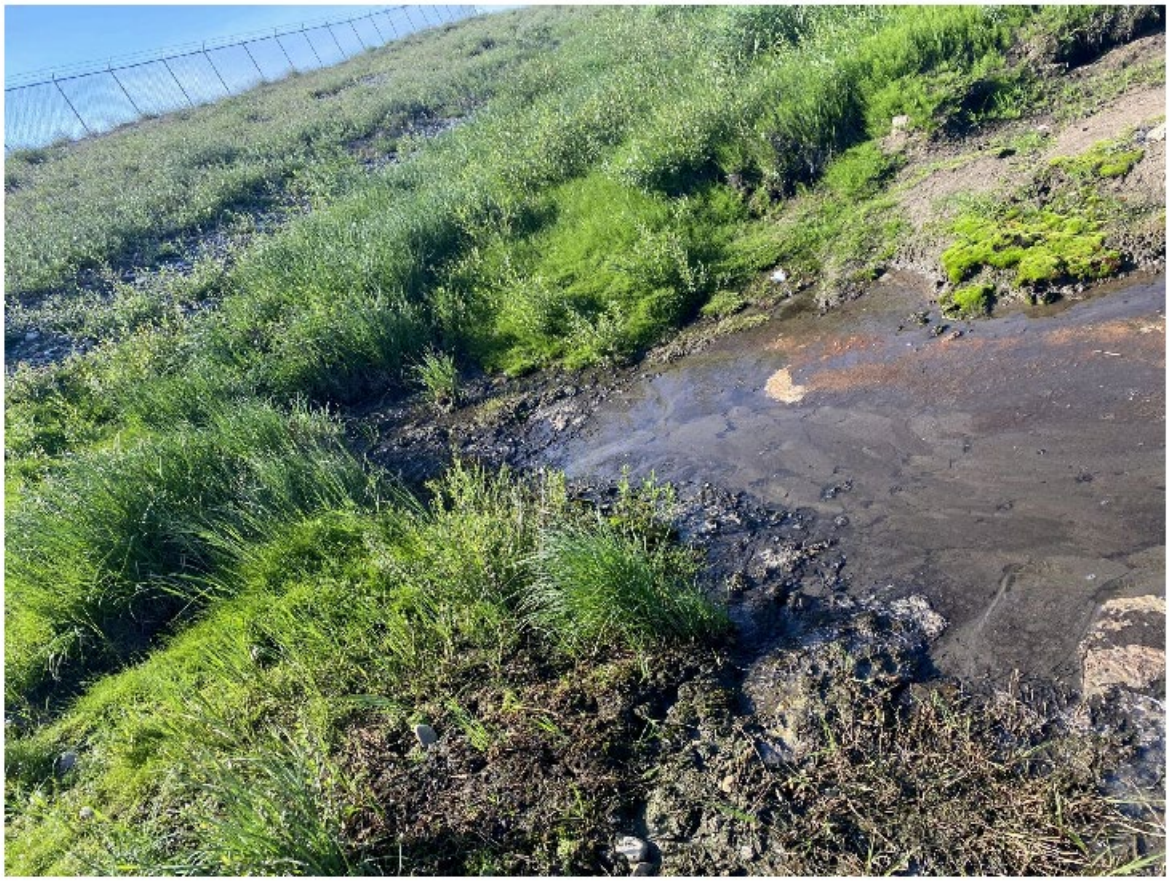


Figure 1: Potential leak site below the north-east side berm July 17, 2024.

Appendix G: Photos of Erosion at Truck Fill Site

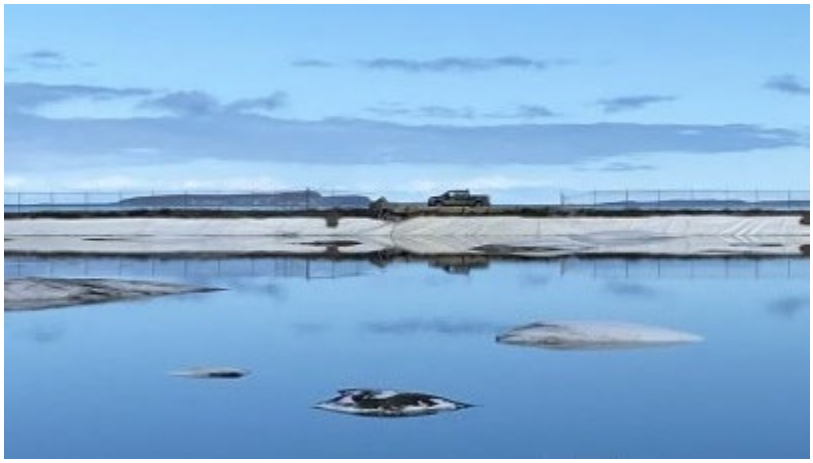


Figure 1: View of the truck fill site erosion from the opposite side of the Lagoon July 17, 2024.

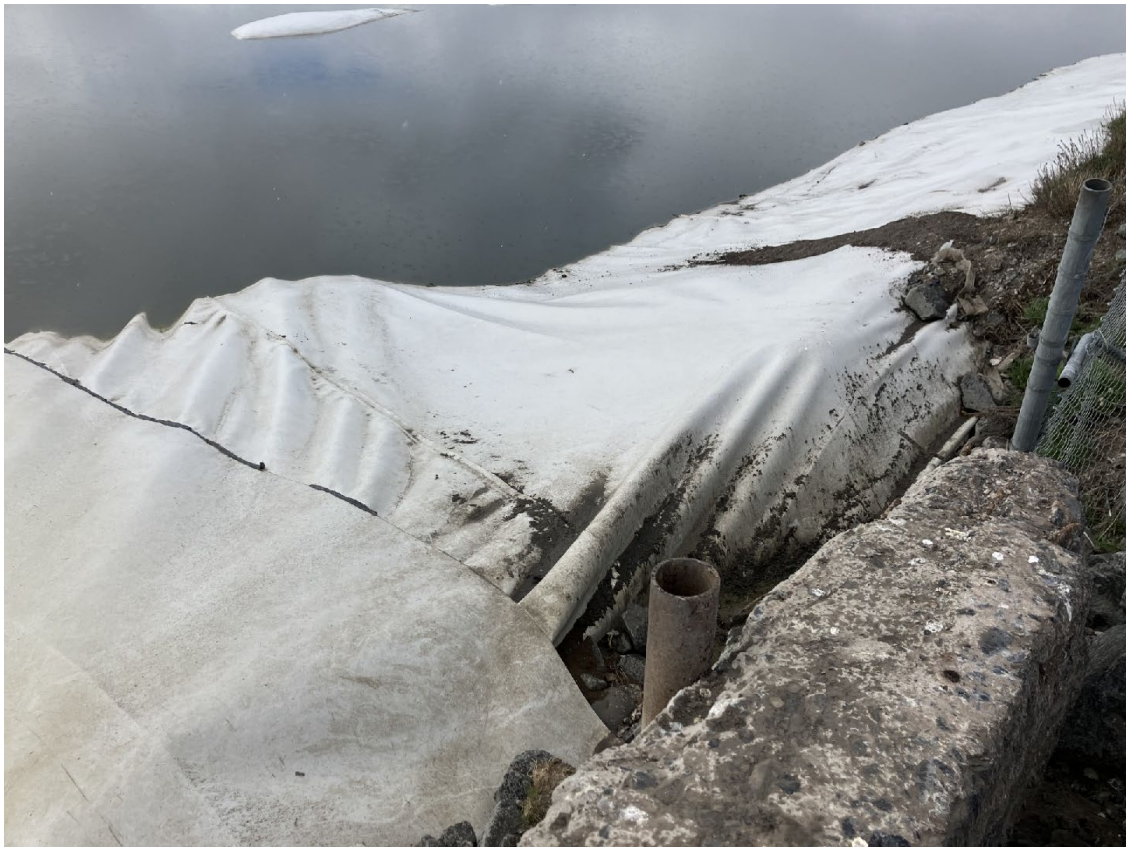


Figure 2: View of the truck fill erosion from above July 17, 2024.

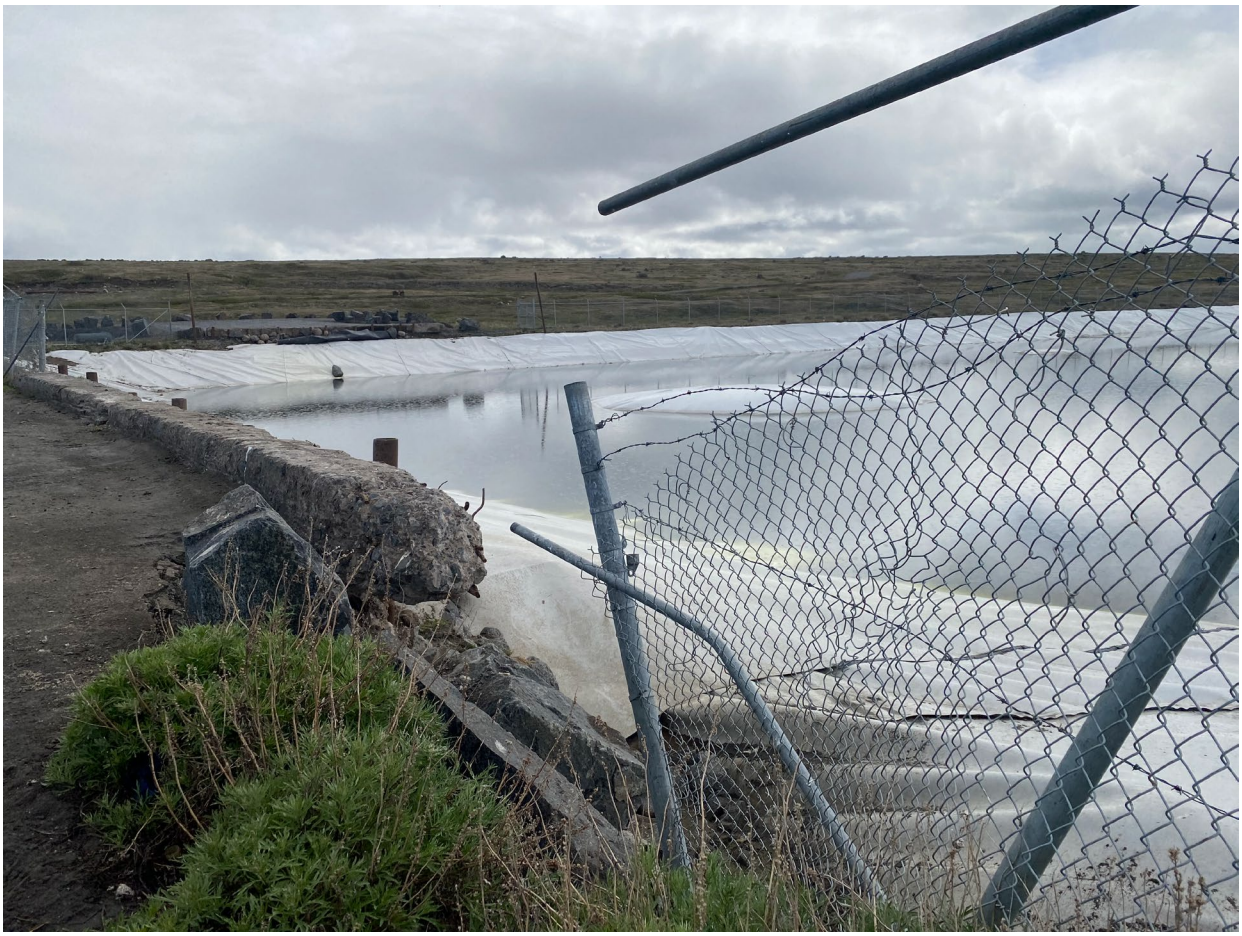


Figure 3: View of truck fill site erosion from the north.