

ANNUAL REPORT FOR THE KUGAARUK LANDFARM

YEAR BEING REPORTED: 2024

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water License No. 1BR-KRK1929 issued to the Government of Nunavut Department of Community and Government Services.

a) A summary report of Waste disposal activities including:

i. quantity and quality of effluent discharged from Landfarm; and

600 m³

ii. quantity and characterization of soils placed within the Landfarm for treatment.

No new soil was placed into the landfarm in 2024.

b) Quantity of Waste backhauled to an approved facility for disposal;

There was no waste backhauled to an approved facility for disposal in 2024.

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

There were no unauthorized discharges in 2024.

d) Any revisions to the management plans, as required by Part B, Item 6, submitted in the form of an Addendum;

There were no revisions to the management plans submitted in the form of an Addendum in 2024.

e) A description of all progressive and/or final reclamation work undertaken, including photographic records of site conditions before, during and after completion of operations;

There was no progressive and/or final reclamation work undertaken in 2024.

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- f) A summary of all information requested and results of the Monitoring Program, an analysis and interpretation of the results, and any follow-up measures that may be required;

Table 1. Monitoring Program Station SW2 Effluent Results

Parameter	Maximum Concentration (mg/L)	SW2 July 26 2024
pH	6.5-9	8.10
TSS	50	<3
Oil and Grease	15 and no visible sheen	Non-Visible
Total Lead	0.001	0.1
Benzene	0.37	<2.00
Toluene	0.002	<2.00
Ethylbenzene	0.09	<2.00

Table 2. Monitoring Program Station SW1 Effluent Results

Parameters	Unit	SW1 July 26 2024
pH	pH	7.03
TSS	mg/L	6
Chloride	mg/L	8.2
Nitrate+Nitrite as Nitrogen	mg/L	0.01
Sulphate	mg/L	2
HC Extractable	mg/L	-
Calcium	mg/L	10.0
Magnesium	mg/L	1.5
Potassium	mg/L	1.2
Sodium	mg/L	6.7
Benzene	mg/L	<2.00
Ethylbenzene	mg/L	<2.00
Toluene	mg/L	<2.00
Xylenes	mg/L	<2.00
Aluminium	µg/L	1140
Arsenic	µg/L	0.2
Cadmium	µg/L	<0.04
Chromium	µg/L	1.6
Cobalt	µg/L	0.4

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Copper	µg/L	2.1
Iron	µg/L	1030
Lead	µg/L	0.6
Manganese	µg/L	13.8
Mercury	µg/L	<0.01
Nickel	µg/L	1.1
Zinc	µg/L	7.6
Total Phenol	mg/L	<0.0010
Hardness	mg/L	31.2
PAH	mg/L	-
Conductivity	mg/L	93.5
Ammonia Nitrogen	mg/L	<0.005
Oil and grease (visual)	mg/L	Non-Visible
Alkalinity	mg/L	29.3
Phosphorous	mg/L	-

Table 3. Petroleum Hydrocarbon Contaminant Levels at Soil Locations LF1-LF4

	CCME Guideline for Industrial Land Use	June 27 2023 (ppm)			
Parameter	Coarse (ppm)	LF-1	LF-2	LF-3	LF-4
Benzene	0.03	0.162	0.0185	0.0175	0.0203
Toluene	0.37	<0.050	<0.050	<0.050	<0.050
Ethylbenzene	0.082	<0.015	<0.015	<0.015	<0.015
Xylenes	11	<0.050	<0.050	<0.050	<0.050
F1	320	<5.0	<5.0	<5.0	<5.0
F2	260	64	55	79	26
F3	1700	60	102	97	84
F4	3300	<50	<50	<50	<50
Lead	600	4.90	7.39	5.11	5.62

- Groundwater is not observed within the monitoring wells M1-M6.

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- g) **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 Licence and an outline of any work anticipated for the next year;**
- There was no relevant construction activities, modifications and/or major maintenance work carried out on facilities under this licence in 2024 and there is no work anticipated for 2025.
- h) **A summary of public consultation/participation, describing consultation with local organizations and residents of the nearby communities, if any were conducted;**
- There was no public consultation/participation conducted in 2024.
- i) **Any other details on Waste disposal requested by the Board by the 1st November of the year being reported.**
- There were no other details on Waste disposal requested by the Board by the 1st of November of 2024.

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

- No soil was removed from the landfarm in 2024.

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

- A CIRNAC inspection did not take place in 2024.

List of Appendices

Appendix A: Laboratory Certificate of Analysis

- **Laboratory Certificate of Analysis 07/26/2024 – 10 pages**
- **Laboratory Certificate of Analysis – 07/26/2024 – 6 pages**
- **Laboratory Certificate of Analysis – 07/26/2024 – 30 pages**

Appendix B: CIRNAC Inspection Report - 1 page

**ANNUAL REPORT
FOR THE KUGAARUK LANDFARM**

Appendix A: 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.:
241119

- FINAL REPORT -

Prepared For: Government of Nunavut - CGS Kugaaruk

Address:

Kugaaruk, NU
X0B 1K0

Attn: Madeline Cole

Facsimile:

Final report has been reviewed and approved by:

Bradley Koswan
A/Lab 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: 16-Aug-24
Print Date: 16-Aug-24

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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.:
241119

- CERTIFICATE OF ANALYSIS -

Client Sample ID: SW-1

Taiga Sample ID: 001

Client Project:

Sample Type: Landfarm Leachate

Received Date: 29-Jul-24

Sampling Date: 26-Jul-24

Sampling Time: 9:00

Location: Kugaaruk Landfarm

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
<u>Cations by ICP-MS</u>						
Calcium	10.0	0.1	mg/L	01-Aug-24	TEL035	
Hardness	31.2	0.7	mg/L	01-Aug-24	TEL035	
Magnesium	1.5	0.1	mg/L	01-Aug-24	TEL035	
Potassium	1.2	0.1	mg/L	01-Aug-24	TEL035	
Sodium	6.7	0.1	mg/L	01-Aug-24	TEL035	
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen	< 0.005	0.005	mg/L	31-Jul-24	TEL068	
Phosphorous, Total	0.012	0.002	mg/L	02-Aug-24	TEL069	
<u>Inorganics - Physicals</u>						
Alkalinity, Total (as CaCO ₃)	29.3	0.4	mg/L	29-Jul-24	TEL060	
Conductivity, Specific (@25C)	93.5	0.4	µS/cm	29-Jul-24	TEL059	
pH	7.03		pH units	29-Jul-24	TEL058	
Solids, Total Dissolved	31	10	mg/L	31-Jul-24	TEL009	
Solids, Total Suspended	6	3	mg/L	31-Jul-24	TEL008	

Major Ions

ReportDate: 16-Aug-24

Print Date: 16-Aug-24



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- CERTIFICATE OF ANALYSIS -

Client Sample ID: **SW-1**

Taiga Sample ID: **001**

Chloride	8.2	0.7	mg/L	30-Jul-24	TEL055
Nitrate as Nitrogen	0.01	0.01	mg/L	30-Jul-24	TEL055
Nitrate+Nitrite as Nitrogen	0.01	0.01	mg/L	30-Jul-24	TEL055
Nitrite as Nitrogen	< 0.01	0.01	mg/L	30-Jul-24	TEL055
Sulphate	2	1	mg/L	30-Jul-24	TEL055

Organics

Benzene	< 2.00	2	µg/L	01-Aug-24	TEL037
Ethylbenzene	< 2.00	2	µg/L	01-Aug-24	TEL037
Hydrocarbons, Total Purgeable	< 0.3	0.3	mg/L	01-Aug-24	TEL044
Oil and Grease, visible	Non-visible			29-Jul-24	Visual Exam
Toluene	< 2.00	2	µg/L	01-Aug-24	TEL037
Xylenes	< 2.00	2	µg/L	01-Aug-24	TEL037

Subcontracted Organics

1-methylnaphthalene	< 0.010	0.01	µg/L	01-Aug-24	EPA3510
2-methylnaphthalene	< 0.010	0.01	µg/L	01-Aug-24	EPA3510
Acenaphthene	< 0.010	0.01	ug/L	01-Aug-24	EPA3510
Acenaphthylene	< 0.010	0.01	ug/L	01-Aug-24	EPA3510
Acridine	< 0.010	0.01	ug/L	01-Aug-24	EPA3510
Anthracene	< 0.010	0.01	ug/L	01-Aug-24	EPA3510
Benzo(a)anthracene	< 0.010	0.01	µg/L	01-Aug-24	EPA3510
Benzo(a)pyrene	< 0.0050	0.005	ug/L	01-Aug-24	EPA3510
Benzo(b+j+k)fluoranthene	< 0.015	0.015	µg/L	01-Aug-24	EPA3510
Benzo(bj)fluoranthene	< 0.010	0.01	ug/L	01-Aug-24	EPA3510
Benzo(g,h,i)perylene	< 0.010	0.01	ug/L	01-Aug-24	EPA3510
Benzo(k)fluoranthene	< 0.010	0.01	ug/L	01-Aug-24	EPA3510

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- CERTIFICATE OF ANALYSIS -

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Chrysene	< 0.010	0.01	µg/L	01-Aug-24	EPA3510
Dibenzo(a,h)anthracene	< 0.0050	0.005	µg/L	01-Aug-24	EPA3510
F2: C10-C16	< 0.10	0.1	mg/L	14-Aug-24	EPA3510
F3: C16-C34	< 0.25	0.25	mg/L	14-Aug-24	EPA3510
F4: C34-C50	< 0.25	0.25	mg/L	14-Aug-24	EPA3510
Fluoranthene	< 0.010	0.01	µg/L	01-Aug-24	EPA3510
Fluorene	< 0.010	0.01	ug/L	01-Aug-24	EPA3510
Indeno(1,2,3-cd)pyrene	< 0.010	0.01	µg/L	01-Aug-24	EPA3510
Naphthalene	< 0.050	0.05	µg/L	01-Aug-24	EPA3510
Phenanthrene	< 0.020	0.02	µg/L	01-Aug-24	EPA3510
Phenols, Total	< 0.0010	0.001	mg/L	01-Aug-24	AB ENV.06537
Pyrene	< 0.010	0.01	µg/L	01-Aug-24	EPA3510
Quinoline	< 0.050	0.05	µg/L	01-Aug-24	EPA3510

Trace Metals, Total

Aluminum	1140	0.6	µg/L	07-Aug-24	TEL035
Antimony	< 0.1	0.1	µg/L	07-Aug-24	TEL035
Arsenic	0.2	0.2	µg/L	07-Aug-24	TEL035
Barium	12.8	0.1	µg/L	07-Aug-24	TEL035
Beryllium	< 0.1	0.1	µg/L	07-Aug-24	TEL035
Bismuth	< 0.2	0.2	µg/L	07-Aug-24	TEL035
Boron	9.8	0.9	µg/L	07-Aug-24	TEL035
Cadmium	< 0.04	0.04	µg/L	07-Aug-24	TEL035
Cesium	0.2	0.1	µg/L	07-Aug-24	TEL035
Chromium	1.6	0.1	µg/L	07-Aug-24	TEL035
Cobalt	0.4	0.1	µg/L	07-Aug-24	TEL035

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Client Sample ID: SW-1

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Copper	2.1	0.2	µg/L	07-Aug-24	TEL035
Iron	1030	5	µg/L	07-Aug-24	TEL035
Lead	0.6	0.1	µg/L	07-Aug-24	TEL035
Manganese	13.8	0.1	µg/L	07-Aug-24	TEL035
Mercury	< 0.01	0.01	µg/L	07-Aug-24	TEL035
Molybdenum	0.8	0.1	µg/L	07-Aug-24	TEL035
Nickel	1.1	0.1	µg/L	07-Aug-24	TEL035
Rubidium	4.9	0.1	µg/L	07-Aug-24	TEL035
Selenium	< 0.3	0.3	µg/L	07-Aug-24	TEL035
Silver	< 0.1	0.1	µg/L	07-Aug-24	TEL035
Strontium	45.2	0.1	µg/L	07-Aug-24	TEL035
Thallium	< 0.1	0.1	µg/L	07-Aug-24	TEL035
Titanium	65.8	0.1	µg/L	07-Aug-24	TEL035
Uranium	3.1	0.1	µg/L	07-Aug-24	TEL035
Vanadium	1.9	0.1	µg/L	07-Aug-24	TEL035
Zinc	7.6	0.4	µg/L	07-Aug-24	TEL035

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

Taiga Batch No.:
241119

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **SW-2**

Taiga Sample ID: **002**

Client Project:

Sample Type: Landfarm Leachate

Received Date: 29-Jul-24

Sampling Date: 26-Jul-24

Sampling Time: 9:00

Location: Kugaaruk Landfarm

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Cations by ICP-MS</u>						
Calcium	30.1	0.1	mg/L	01-Aug-24	TEL035	
Hardness	104	0.7	mg/L	01-Aug-24	TEL035	
Magnesium	7.0	0.1	mg/L	01-Aug-24	TEL035	
Potassium	3.6	0.1	mg/L	01-Aug-24	TEL035	
Sodium	6.1	0.1	mg/L	01-Aug-24	TEL035	
<u>Inorganics - Nutrients</u>						
Ammonia as Nitrogen	0.013	0.005	mg/L	31-Jul-24	TEL068	
Phosphorous, Total	0.024	0.002	mg/L	02-Aug-24	TEL069	
<u>Inorganics - Physicals</u>						
Alkalinity, Total (as CaCO ₃)	94.0	0.4	mg/L	29-Jul-24	TEL060	
Conductivity, Specific (@25C)	212	0.4	µS/cm	29-Jul-24	TEL059	
pH	8.10		pH units	29-Jul-24	TEL058	
Solids, Total Dissolved	133	10	mg/L	31-Jul-24	TEL009	
Solids, Total Suspended	< 3	3	mg/L	31-Jul-24	TEL008	
<u>Major Ions</u>						
Chloride	5.4	0.7	mg/L	30-Jul-24	TEL055	

ReportDate: 16-Aug-24

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Client Sample ID: **SW-2**

Taiga Sample ID: **002**

Nitrate as Nitrogen	0.02	0.01	mg/L	30-Jul-24	TEL055
Nitrate+Nitrite as Nitrogen	0.02	0.01	mg/L	30-Jul-24	TEL055
Nitrite as Nitrogen	< 0.01	0.01	mg/L	30-Jul-24	TEL055
Sulphate	2	1	mg/L	30-Jul-24	TEL055

Organics

Benzene	< 2.00	2	µg/L	01-Aug-24	TEL037
Ethylbenzene	< 2.00	2	µg/L	01-Aug-24	TEL037
Hydrocarbons, Total Purgeable	< 0.3	0.3	mg/L	01-Aug-24	TEL044
Oil and Grease, visible	Non-visible			29-Jul-24	Visual Exam
Toluene	< 2.00	2	µg/L	01-Aug-24	TEL037
Xylenes	< 2.00	2	µg/L	01-Aug-24	TEL037

Subcontracted Organics

1-methylnaphthalene	< 0.013	0.013	µg/L	01-Aug-24	EPA3510	236
2-methylnaphthalene	< 0.019	0.019	µg/L	01-Aug-24	EPA3510	236
Acenaphthene	< 0.012	0.012	ug/L	01-Aug-24	EPA3510	236
Acenaphthylene	< 0.010	0.01	ug/L	01-Aug-24	EPA3510	
Acridine	< 0.010	0.01	ug/L	01-Aug-24	EPA3510	
Anthracene	< 0.010	0.01	ug/L	01-Aug-24	EPA3510	
Benzo(a)anthracene	< 0.010	0.01	µg/L	01-Aug-24	EPA3510	
Benzo(a)pyrene	< 0.0050	0.005	ug/L	01-Aug-24	EPA3510	
Benzo(b+j+k)fluoranthene	< 0.015	0.015	µg/L	01-Aug-24	EPA3510	
Benzo(bj)fluoranthene	< 0.010	0.01	ug/L	01-Aug-24	EPA3510	
Benzo(g,h,i)perylene	< 0.010	0.01	ug/L	01-Aug-24	EPA3510	
Benzo(k)fluoranthene	< 0.010	0.01	ug/L	01-Aug-24	EPA3510	
Chrysene	< 0.010	0.01	µg/L	01-Aug-24	EPA3510	

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Client Sample ID: **SW-2**

Taiga Sample ID: **002**

Dibenzo(a,h)anthracene	< 0.0050	0.005	µg/L	01-Aug-24	EPA3510	
F2: C10-C16	< 0.10	0.1	mg/L	14-Aug-24	EPA3510	
F3: C16-C34	< 0.25	0.25	mg/L	14-Aug-24	EPA3510	
F4: C34-C50	< 0.25	0.25	mg/L	14-Aug-24	EPA3510	
Fluoranthene	< 0.010	0.01	µg/L	01-Aug-24	EPA3510	
Fluorene	< 0.010	0.01	ug/L	01-Aug-24	EPA3510	
Indeno(1,2,3-cd)pyrene	< 0.010	0.01	µg/L	01-Aug-24	EPA3510	
Naphthalene	< 0.050	0.05	µg/L	01-Aug-24	EPA3510	
Phenanthrene	< 0.020	0.02	µg/L	01-Aug-24	EPA3510	
Phenols, Total	< 0.0010	0.001	mg/L	01-Aug-24	AB ENV.06537	
Pyrene	< 0.010	0.01	µg/L	01-Aug-24	EPA3510	
Quinoline	< 0.190	0.190	µg/L	01-Aug-24	EPA3510	236

Trace Metals, Total

Aluminum	79.4	0.6	µg/L	07-Aug-24	TEL035	
Antimony	0.1	0.1	µg/L	07-Aug-24	TEL035	
Arsenic	0.7	0.2	µg/L	07-Aug-24	TEL035	
Barium	6.9	0.1	µg/L	07-Aug-24	TEL035	
Beryllium	< 0.1	0.1	µg/L	07-Aug-24	TEL035	
Bismuth	< 0.2	0.2	µg/L	07-Aug-24	TEL035	
Boron	38.2	0.9	µg/L	07-Aug-24	TEL035	
Cadmium	< 0.04	0.04	µg/L	07-Aug-24	TEL035	
Cesium	< 0.1	0.1	µg/L	07-Aug-24	TEL035	
Chromium	0.2	0.1	µg/L	07-Aug-24	TEL035	
Cobalt	0.1	0.1	µg/L	07-Aug-24	TEL035	
Copper	1.6	0.2	µg/L	07-Aug-24	TEL035	

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Taiga Environmental Laboratory
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- CERTIFICATE OF ANALYSIS -

Client Sample ID: SW-2

Taiga Sample ID: 002

Iron	130	5	µg/L	07-Aug-24	TEL035
Lead	0.1	0.1	µg/L	07-Aug-24	TEL035
Manganese	17.0	0.1	µg/L	07-Aug-24	TEL035
Mercury	< 0.01	0.01	µg/L	07-Aug-24	TEL035
Molybdenum	1.6	0.1	µg/L	07-Aug-24	TEL035
Nickel	0.6	0.1	µg/L	07-Aug-24	TEL035
Rubidium	1.1	0.1	µg/L	07-Aug-24	TEL035
Selenium	< 0.3	0.3	µg/L	07-Aug-24	TEL035
Silver	< 0.1	0.1	µg/L	07-Aug-24	TEL035
Strontium	168	0.1	µg/L	07-Aug-24	TEL035
Thallium	< 0.1	0.1	µg/L	07-Aug-24	TEL035
Titanium	4.7	0.1	µg/L	07-Aug-24	TEL035
Uranium	6.1	0.1	µg/L	07-Aug-24	TEL035
Vanadium	0.3	0.1	µg/L	07-Aug-24	TEL035
Zinc	0.6	0.4	µg/L	07-Aug-24	TEL035

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- CERTIFICATE OF ANALYSIS -

Client Sample ID: **SW-2**

Taiga Sample ID: **002**

- DATA QUALIFIERS -

Data Qualifier Descriptions:

236 *Detection Limit Raised:Chromatographic Interference due to co-elution.*

*** 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: 16-Aug-24

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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.:
241120

- FINAL REPORT -

Prepared For: Government of Nunavut - CGS Kugaaruk

Address:

Kugaaruk, NU
X0B 1K0

Attn: Madeline Cole

Facsimile:

Final report has been reviewed and approved by:

Bradley Koswan
A/Lab 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: 12-Aug-24
Print Date: 12-Aug-24

Page 1 of 6



Taiga Environmental Laboratory

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

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

Taiga Batch No.:
241120

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **LF-1**

Taiga Sample ID: **001**

Client Project:

Sample Type: Soil

Received Date: 29-Jul-24

Sampling Date: 26-Jul-24

Sampling Time:

Location: Kugaaruk Landfarm

Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Subcontracted Metals</u>						
Metals in Soil	See Attached				NA	
<u>Subcontracted Organics</u>						
BTEX, F1, Total Extractable HC	See Attached				NA	

ReportDate: 12-Aug-24

Print Date: **12-Aug-24**

Page 2 of 6



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

Taiga Batch No.:
241120

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **LF-2**

Taiga Sample ID: **002**

Client Project:

Sample Type: Soil

Received Date: 29-Jul-24

Sampling Date: 26-Jul-24

Sampling Time:

Location: Kugaaruk Landfarm

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Subcontracted Metals</u>						
Metals in Soil	See Attached				NA	
<u>Subcontracted Organics</u>						
BTEX, F1, Total Extractable HC	See Attached				NA	

ReportDate: 12-Aug-24

Print Date: 12-Aug-24

Page 3 of 6



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

Taiga Batch No.:
241120

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **LF-3**

Taiga Sample ID: **003**

Client Project:

Sample Type: Soil

Received Date: 29-Jul-24

Sampling Date: 26-Jul-24

Sampling Time:

Location: Kugaaruk Landfarm

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Subcontracted Metals</u>						
Metals in Soil	See Attached				NA	
<u>Subcontracted Organics</u>						
BTEX, F1, Total Extractable HC	See Attached				NA	

ReportDate: 12-Aug-24

Print Date: 12-Aug-24

Page 4 of 6



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

Taiga Batch No.:
241120

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **LF-4**

Taiga Sample ID: **004**

Client Project:

Sample Type: Soil

Received Date: 29-Jul-24

Sampling Date: 26-Jul-24

Sampling Time:

Location: Kugaaruk Landfarm

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Subcontracted Metals</u>						
Metals in Soil	See Attached				NA	
<u>Subcontracted Organics</u>						
BTEX, F1, Total Extractable HC	See Attached				NA	

ReportDate: 12-Aug-24

Print Date: 12-Aug-24

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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.:
241120

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **LF-4**

Taiga Sample ID: **004**

*** 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: 12-Aug-24

Print Date: **12-Aug-24**

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CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: YL2401032	Page	: 1 of 5
Client	: Government of the Northwest Territories	Laboratory	: ALS Environmental - Yellowknife
Contact	: Judy Mah	Account Manager	: Oliver Gregg
Address	: Taiga Environmental Lab 4601 52 Ave Yellowknife NT Canada X1A 2L9	Address	: 314 Old Airport Road, Unit 116 Yellowknife, Northwest Territories Canada X1A 3T3
Telephone	: 867 765 6638	Telephone	: 1 867 445 7143
Project	: ----	Date Samples Received	: 29-Jul-2024 16:30
PO	: 3913	Date Analysis Commenced	: 01-Aug-2024
C-O-C number	: ----	Issue Date	: 06-Aug-2024 11:00
Sampler	: ----		
Site	: ----		
Quote number	: YL23-GPNT100-001		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Cynthia Bauer	Organic Supervisor	Organics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Metals, Calgary, Alberta
Maqsood UIHassan	Laboratory Analyst	Organics, Calgary, Alberta
Marsha Calero	Laboratory Assistant	Organics, Calgary, Alberta



No Breaches Found

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

Unit	Description
-	no units
%	percent
mg/kg	milligrams per kilogram

>: greater than.

<: less than.

Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).

For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.



Analytical Results Evaluation

Matrix: Soil/Solid				Client sample ID	2411020-001	2411020-002	2411020-003	2411020-004	----	----	----
				Sampling date/time	26-Jul-2024 00:00	26-Jul-2024 00:00	26-Jul-2024 00:00	26-Jul-2024 00:00	----	----	----
				Sub-Matrix	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	----	----	----
Analyte	CAS Number	Method/Lab	Unit		YL2401032-001	YL2401032-002	YL2401032-003	YL2401032-004	-----	-----	-----
Physical Tests											
Moisture	----	E144/CG	%		3.10	5.06	5.68	4.23	----	----	----
Metals											
Aluminum	7429-90-5	E440/CG	mg/kg		4980	4500	5660	6020	----	----	----
Antimony	7440-36-0	E440/CG	mg/kg		<0.10	<0.10	<0.10	<0.10	----	----	----
Arsenic	7440-38-2	E440/CG	mg/kg		3.39	1.63	1.83	1.92	----	----	----
Barium	7440-39-3	E440/CG	mg/kg		20.2	18.6	24.4	24.5	----	----	----
Beryllium	7440-41-7	E440/CG	mg/kg		0.23	0.22	0.26	0.28	----	----	----
Bismuth	7440-69-9	E440/CG	mg/kg		<0.20	<0.20	<0.20	<0.20	----	----	----
Boron	7440-42-8	E440/CG	mg/kg		<5.0	<5.0	<5.0	<5.0	----	----	----
Cadmium	7440-43-9	E440/CG	mg/kg		0.024	0.041	0.038	0.061	----	----	----
Calcium	7440-70-2	E440/CG	mg/kg		2380	2390	3010	3030	----	----	----
Chromium	7440-47-3	E440/CG	mg/kg		11.0	11.3	14.4	15.7	----	----	----
Cobalt	7440-48-4	E440/CG	mg/kg		3.18	3.13	3.81	4.08	----	----	----
Copper	7440-50-8	E440/CG	mg/kg		4.34	4.18	5.19	8.58	----	----	----
Iron	7439-89-6	E440/CG	mg/kg		8750	8820	10200	10800	----	----	----
Lead	7439-92-1	E440/CG	mg/kg		4.90	7.39	5.11	5.62	----	----	----
Lithium	7439-93-2	E440/CG	mg/kg		11.1	10.6	12.7	12.9	----	----	----
Magnesium	7439-95-4	E440/CG	mg/kg		3650	3250	3980	4330	----	----	----
Manganese	7439-96-5	E440/CG	mg/kg		122	112	159	156	----	----	----
Molybdenum	7439-98-7	E440/CG	mg/kg		0.19	0.22	0.60	0.35	----	----	----
Nickel	7440-02-0	E440/CG	mg/kg		7.27	6.05	7.20	8.41	----	----	----
Phosphorus	7723-14-0	E440/CG	mg/kg		459	481	526	572	----	----	----
Potassium	7440-09-7	E440/CG	mg/kg		1260	1360	1730	1650	----	----	----
Selenium	7782-49-2	E440/CG	mg/kg		<0.20	<0.20	<0.20	<0.20	----	----	----
Silver	7440-22-4	E440/CG	mg/kg		<0.10	<0.10	<0.10	<0.10	----	----	----
Sodium	7440-23-5	E440/CG	mg/kg		116	122	153	146	----	----	----
Strontium	7440-24-6	E440/CG	mg/kg		5.38	5.52	7.28	7.17	----	----	----
Sulfur	7704-34-9	E440/CG	mg/kg		<1000	<1000	<1000	<1000	----	----	----



Analytical Results Evaluation

Matrix: Soil/Solid				Client sample ID	2411020-001	2411020-002	2411020-003	2411020-004	----	----	----
				Sampling date/time	26-Jul-2024 00:00	26-Jul-2024 00:00	26-Jul-2024 00:00	26-Jul-2024 00:00	----	----	----
				Sub-Matrix	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	----	----	----
Analyte	CAS Number	Method/Lab	Unit	YL2401032-001	YL2401032-002	YL2401032-003	YL2401032-004	-----	-----	-----	-----
Metals											
Thallium	7440-28-0	E440/CG	mg/kg	0.085	0.091	0.112	0.106	----	----	----	----
Tin	7440-31-5	E440/CG	mg/kg	<2.0	<2.0	<2.0	<2.0	----	----	----	----
Titanium	7440-32-6	E440/CG	mg/kg	422	425	501	524	----	----	----	----
Tungsten	7440-33-7	E440/CG	mg/kg	<0.50	<0.50	<0.50	<0.50	----	----	----	----
Uranium	7440-61-1	E440/CG	mg/kg	1.54	1.23	1.86	1.94	----	----	----	----
Vanadium	7440-62-2	E440/CG	mg/kg	16.7	16.0	19.6	20.2	----	----	----	----
Zinc	7440-66-6	E440/CG	mg/kg	19.1	20.3	24.8	26.5	----	----	----	----
Zirconium	7440-67-7	E440/CG	mg/kg	3.3	2.9	3.4	3.3	----	----	----	----
Volatile Organic Compounds [Fuels]											
Benzene	71-43-2	E611A/CG	mg/kg	0.0162	0.0185	0.0175	0.0203	----	----	----	----
Ethylbenzene	100-41-4	E611A/CG	mg/kg	<0.015	<0.015	<0.015	<0.015	----	----	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A/CG	mg/kg	<0.040	<0.040	<0.040	<0.040	----	----	----	----
Styrene	100-42-5	E611A/CG	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----
Toluene	108-88-3	E611A/CG	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----
Xylene, m+p-	179601-23-1	E611A/CG	mg/kg	<0.030	<0.030	<0.030	<0.030	----	----	----	----
Xylene, o-	95-47-6	E611A/CG	mg/kg	<0.030	<0.030	<0.030	<0.030	----	----	----	----
Xylenes, total	1330-20-7	E611A/CG	mg/kg	<0.050	<0.050	<0.050	<0.050	----	----	----	----
BTEX, total	----	E611A/CG	mg/kg	<0.10	<0.10	<0.10	<0.10	----	----	----	----
BTEX+Styrene, total	n/a	E611A/CG	mg/kg	<0.15	<0.15	<0.15	<0.15	----	----	----	----
Hydrocarbons											
Chromatogram to baseline at nC50	n/a	E601.SG/CG	-	YES	YES	YES	YES	----	----	----	----
F1 (C6-C10)	----	E581.VH+F1/CG	mg/kg	<5.0	<5.0	<5.0	<5.0	----	----	----	----
F2 (C10-C16)	----	E601.SG/CG	mg/kg	64	55	79	26	----	----	----	----
F3 (C16-C34)	----	E601.SG/CG	mg/kg	60	102	97	84	----	----	----	----
F4 (C34-C50)	----	E601.SG/CG	mg/kg	<50	<50	<50	<50	----	----	----	----
TEH (C10-C50)	n/a	E601.SG/CG	mg/kg	124	157	176	110	----	----	----	----
TEH (C16-C50)	----	E601.SG/CG	mg/kg	<75	102	97	84	----	----	----	----
VHs (C6-C10)	----	E581.VH+F1/CG	mg/kg	<10	<10	<10	<10	----	----	----	----
Hydrocarbons Surrogates											



Analytical Results Evaluation

Matrix: Soil/Solid				Client sample ID	2411020-001	2411020-002	2411020-003	2411020-004	----	----	----
				Sampling date/time	26-Jul-2024 00:00	26-Jul-2024 00:00	26-Jul-2024 00:00	26-Jul-2024 00:00	----	----	----
				Sub-Matrix	Soil/Solid	Soil/Solid	Soil/Solid	Soil/Solid	----	----	----
Analyte	CAS Number	Method/Lab	Unit	YL2401032-001	YL2401032-002	YL2401032-003	YL2401032-004	-----	-----	-----	-----
Hydrocarbons Surrogates											
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601.SG/CG	%	74.9	71.6	74.6	69.8	----	----	----	----
Dichlorotoluene, 3,4-	95-75-0	E581.VH+F1/CG	%	70.3	74.1	73.8	72.2	----	----	----	----
Volatile Organic Compounds Surrogates											
Bromofluorobenzene, 4-	460-00-4	E611A/CG	%	106	101	107	104	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/CG	%	91.5	90.0	97.6	91.2	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Key:

CERTIFICATE OF ANALYSIS

Work Order	: YL2401032	Page	: 1 of 5
Client	: Government of the Northwest Territories	Laboratory	: ALS Environmental - Yellowknife
Contact	: Judy Mah	Account Manager	: Oliver Gregg
Address	: Taiga Environmental Lab 4601 52 Ave Yellowknife NT Canada X1A 2L9	Address	: 314 Old Airport Road, Unit 116 Yellowknife NT Canada X1A 3T3
Telephone	: 867 765 6638	Telephone	: 1 867 445 7143
Project	: ----	Date Samples Received	: 29-Jul-2024 16:30
PO	: 3913	Date Analysis Commenced	: 01-Aug-2024
C-O-C number	: ----	Issue Date	: 06-Aug-2024 11:00
Sampler	: ----		
Site	: ----		
Quote number	: YL23-GPNT100-001		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Cynthia Bauer	Organic Supervisor	Organics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Metals, Calgary, Alberta
Maqsood UlHassan	Laboratory Analyst	Organics, Calgary, Alberta
Marsha Calero	Laboratory Assistant	Organics, Calgary, Alberta



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	Description
-	no units
%	percent
mg/kg	milligrams per kilogram

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.



Analytical Results

Sub-Matrix: Soil/Solid (Matrix: Soil/Solid)				Client sample ID	2411020-001	2411020-002	2411020-003	2411020-004	----
Client sampling date / time					26-Jul-2024 00:00	26-Jul-2024 00:00	26-Jul-2024 00:00	26-Jul-2024 00:00	----
Analyte	CAS Number	Method/Lab	LOR	Unit	YL2401032-001	YL2401032-002	YL2401032-003	YL2401032-004	-----
					Result	Result	Result	Result	----
Physical Tests									
Moisture	----	E144/CG	0.25	%	3.10	5.06	5.68	4.23	----
Metals									
Aluminum	7429-90-5	E440/CG	50	mg/kg	4980	4500	5660	6020	----
Antimony	7440-36-0	E440/CG	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	----
Arsenic	7440-38-2	E440/CG	0.10	mg/kg	3.39	1.63	1.83	1.92	----
Barium	7440-39-3	E440/CG	0.50	mg/kg	20.2	18.6	24.4	24.5	----
Beryllium	7440-41-7	E440/CG	0.10	mg/kg	0.23	0.22	0.26	0.28	----
Bismuth	7440-69-9	E440/CG	0.20	mg/kg	<0.20	<0.20	<0.20	<0.20	----
Boron	7440-42-8	E440/CG	5.0	mg/kg	<5.0	<5.0	<5.0	<5.0	----
Cadmium	7440-43-9	E440/CG	0.020	mg/kg	0.024	0.041	0.038	0.061	----
Calcium	7440-70-2	E440/CG	50	mg/kg	2380	2390	3010	3030	----
Chromium	7440-47-3	E440/CG	0.50	mg/kg	11.0	11.3	14.4	15.7	----
Cobalt	7440-48-4	E440/CG	0.10	mg/kg	3.18	3.13	3.81	4.08	----
Copper	7440-50-8	E440/CG	0.50	mg/kg	4.34	4.18	5.19	8.58	----
Iron	7439-89-6	E440/CG	50	mg/kg	8750	8820	10200	10800	----
Lead	7439-92-1	E440/CG	0.50	mg/kg	4.90	7.39	5.11	5.62	----
Lithium	7439-93-2	E440/CG	2.0	mg/kg	11.1	10.6	12.7	12.9	----
Magnesium	7439-95-4	E440/CG	20	mg/kg	3650	3250	3980	4330	----
Manganese	7439-96-5	E440/CG	1.0	mg/kg	122	112	159	156	----
Molybdenum	7439-98-7	E440/CG	0.10	mg/kg	0.19	0.22	0.60	0.35	----
Nickel	7440-02-0	E440/CG	0.50	mg/kg	7.27	6.05	7.20	8.41	----
Phosphorus	7723-14-0	E440/CG	50	mg/kg	459	481	526	572	----
Potassium	7440-09-7	E440/CG	100	mg/kg	1260	1360	1730	1650	----
Selenium	7782-49-2	E440/CG	0.20	mg/kg	<0.20	<0.20	<0.20	<0.20	----
Silver	7440-22-4	E440/CG	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	----
Sodium	7440-23-5	E440/CG	50	mg/kg	116	122	153	146	----
Strontium	7440-24-6	E440/CG	0.50	mg/kg	5.38	5.52	7.28	7.17	----
Sulfur	7704-34-9	E440/CG	1000	mg/kg	<1000	<1000	<1000	<1000	----
Thallium	7440-28-0	E440/CG	0.050	mg/kg	0.085	0.091	0.112	0.106	----
Tin	7440-31-5	E440/CG	2.0	mg/kg	<2.0	<2.0	<2.0	<2.0	----



Analytical Results

Sub-Matrix: Soil/Solid					Client sample ID	2411020-001	2411020-002	2411020-003	2411020-004	----
(Matrix: Soil/Solid)										
					Client sampling date / time	26-Jul-2024 00:00	26-Jul-2024 00:00	26-Jul-2024 00:00	26-Jul-2024 00:00	----
Analyte	CAS Number	Method/Lab	LOR	Unit	YL2401032-001	YL2401032-002	YL2401032-003	YL2401032-004	-----	
					Result	Result	Result	Result	----	
Metals										
Titanium	7440-32-6	E440/CG	1.0	mg/kg	422	425	501	524	----	
Tungsten	7440-33-7	E440/CG	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	----	
Uranium	7440-61-1	E440/CG	0.050	mg/kg	1.54	1.23	1.86	1.94	----	
Vanadium	7440-62-2	E440/CG	0.20	mg/kg	16.7	16.0	19.6	20.2	----	
Zinc	7440-66-6	E440/CG	2.0	mg/kg	19.1	20.3	24.8	26.5	----	
Zirconium	7440-67-7	E440/CG	1.0	mg/kg	3.3	2.9	3.4	3.3	----	
Volatile Organic Compounds [Fuels]										
Benzene	71-43-2	E611A/CG	0.0050	mg/kg	0.0162	0.0185	0.0175	0.0203	----	
Ethylbenzene	100-41-4	E611A/CG	0.015	mg/kg	<0.015	<0.015	<0.015	<0.015	----	
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A/CG	0.040	mg/kg	<0.040	<0.040	<0.040	<0.040	----	
Styrene	100-42-5	E611A/CG	0.050	mg/kg	<0.050	<0.050	<0.050	<0.050	----	
Toluene	108-88-3	E611A/CG	0.050	mg/kg	<0.050	<0.050	<0.050	<0.050	----	
Xylene, m+p-	179601-23-1	E611A/CG	0.030	mg/kg	<0.030	<0.030	<0.030	<0.030	----	
Xylene, o-	95-47-6	E611A/CG	0.030	mg/kg	<0.030	<0.030	<0.030	<0.030	----	
Xylenes, total	1330-20-7	E611A/CG	0.050	mg/kg	<0.050	<0.050	<0.050	<0.050	----	
BTEX, total	----	E611A/CG	0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	----	
BTEX+Styrene, total	n/a	E611A/CG	0.15	mg/kg	<0.15	<0.15	<0.15	<0.15	----	
Hydrocarbons										
Chromatogram to baseline at nC50	n/a	E601.SG/CG	-	-	YES	YES	YES	YES	----	
F1 (C6-C10)	----	E581.VH+F1/CG	5.0	mg/kg	<5.0	<5.0	<5.0	<5.0	----	
F2 (C10-C16)	----	E601.SG/CG	25	mg/kg	64	55	79	26	----	
F3 (C16-C34)	----	E601.SG/CG	50	mg/kg	60	102	97	84	----	
F4 (C34-C50)	----	E601.SG/CG	50	mg/kg	<50	<50	<50	<50	----	
TEH (C10-C50)	n/a	E601.SG/CG	75	mg/kg	124	157	176	110	----	
TEH (C16-C50)	----	E601.SG/CG	75	mg/kg	<75	102	97	84	----	
VHs (C6-C10)	----	E581.VH+F1/CG	10	mg/kg	<10	<10	<10	<10	----	
Hydrocarbons Surrogates										
Bromobenzotrifluoride, 2- (F2-F4 surrogate)	392-83-6	E601.SG/CG	1.0	%	74.9	71.6	74.6	69.8	----	



Analytical Results

Sub-Matrix: Soil/Solid					Client sample ID	2411020-001	2411020-002	2411020-003	2411020-004	----
(Matrix: Soil/Solid)										
					Client sampling date / time	26-Jul-2024 00:00	26-Jul-2024 00:00	26-Jul-2024 00:00	26-Jul-2024 00:00	----
Analyte	CAS Number	Method/Lab	LOR	Unit	YL2401032-001	YL2401032-002	YL2401032-003	YL2401032-004	-----	
					Result	Result	Result	Result	----	
Hydrocarbons Surrogates										
Dichlorotoluene, 3,4-	95-75-0	E581.VH+F1/CG	1.0	%	70.3	74.1	73.8	72.2	----	
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/CG	0.10	%	106	101	107	104	----	
Difluorobenzene, 1,4-	540-36-3	E611A/CG	0.10	%	91.5	90.0	97.6	91.2	----	

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: YL2401032	Page	: 1 of 8
Client	: Government of the Northwest Territories	Laboratory	: ALS Environmental - Yellowknife
Contact	: Judy Mah	Account Manager	: Oliver Gregg
Address	: Taiga Environmental Lab 4601 52 Ave Yellowknife NT Canada X1A 2L9	Address	: 314 Old Airport Road, Unit 116 Yellowknife, Northwest Territories Canada X1A 3T3
Telephone	: 867 765 6638	Telephone	: 1 867 445 7143
Project	: ----	Date Samples Received	: 29-Jul-2024 16:30
PO	: 3913	Issue Date	: 06-Aug-2024 11:01
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: YL23-GPNT100-001		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Glass soil jar/Teflon lined cap 2411020-001	E601.SG	26-Jul-2024	02-Aug-2024	14 days	7 days	✓	03-Aug-2024	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Glass soil jar/Teflon lined cap 2411020-002	E601.SG	26-Jul-2024	02-Aug-2024	14 days	7 days	✓	03-Aug-2024	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Glass soil jar/Teflon lined cap 2411020-003	E601.SG	26-Jul-2024	02-Aug-2024	14 days	7 days	✓	03-Aug-2024	40 days	1 days	✓
Hydrocarbons : CCME PHCs - F2-F4 by GC-FID										
Glass soil jar/Teflon lined cap 2411020-004	E601.SG	26-Jul-2024	02-Aug-2024	14 days	7 days	✓	03-Aug-2024	40 days	1 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil jar/Teflon lined cap 2411020-001	E581.VH+F1	26-Jul-2024	01-Aug-2024	0 days	6 days	✗ UCP	01-Aug-2024	0 days	0 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil jar/Teflon lined cap 2411020-002	E581.VH+F1	26-Jul-2024	01-Aug-2024	0 days	6 days	✗ UCP	01-Aug-2024	0 days	0 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil jar/Teflon lined cap 2411020-003	E581.VH+F1	26-Jul-2024	01-Aug-2024	0 days	6 days	✗ UCP	01-Aug-2024	0 days	0 days	✓



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass soil jar/Teflon lined cap 2411020-004	E581.VH+F1	26-Jul-2024	01-Aug-2024	0 days	6 days	✖ UCP	01-Aug-2024	0 days	0 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag 2411020-001	E440	26-Jul-2024	03-Aug-2024	180 days	8 days	✓	04-Aug-2024	180 days	10 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag 2411020-002	E440	26-Jul-2024	03-Aug-2024	180 days	8 days	✓	04-Aug-2024	180 days	10 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag 2411020-003	E440	26-Jul-2024	03-Aug-2024	180 days	8 days	✓	04-Aug-2024	180 days	10 days	✓
Metals : Metals in Soil/Solid by CRC ICPMS										
LDPE bag 2411020-004	E440	26-Jul-2024	03-Aug-2024	180 days	8 days	✓	04-Aug-2024	180 days	10 days	✓
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap 2411020-001	E144	26-Jul-2024	----	----	----		02-Aug-2024	----	7 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap 2411020-002	E144	26-Jul-2024	----	----	----		02-Aug-2024	----	7 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap 2411020-003	E144	26-Jul-2024	----	----	----		02-Aug-2024	----	7 days	
Physical Tests : Moisture Content by Gravimetry										
Glass soil jar/Teflon lined cap 2411020-004	E144	26-Jul-2024	----	----	----		02-Aug-2024	----	7 days	



Matrix: Soil/Solid

Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil jar/Teflon lined cap 2411020-001	E611A	26-Jul-2024	01-Aug-2024	0 days	6 days	✖ UCP	01-Aug-2024	0 days	0 days	✔
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil jar/Teflon lined cap 2411020-002	E611A	26-Jul-2024	01-Aug-2024	0 days	6 days	✖ UCP	01-Aug-2024	0 days	0 days	✔
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil jar/Teflon lined cap 2411020-003	E611A	26-Jul-2024	01-Aug-2024	0 days	6 days	✖ UCP	01-Aug-2024	0 days	0 days	✔
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass soil jar/Teflon lined cap 2411020-004	E611A	26-Jul-2024	01-Aug-2024	0 days	6 days	✖ UCP	01-Aug-2024	0 days	0 days	✔

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Duplicates (DUP)							
BTEX by Headspace GC-MS	E611A	1575084	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601.SG	1577148	1	7	14.2	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1579209	1	20	5.0	5.0	✓
Moisture Content by Gravimetry	E144	1577149	1	20	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	1575085	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
BTEX by Headspace GC-MS	E611A	1575084	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601.SG	1577148	1	7	14.2	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1579209	2	20	10.0	10.0	✓
Moisture Content by Gravimetry	E144	1577149	1	20	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	1575085	1	20	5.0	5.0	✓
Method Blanks (MB)							
BTEX by Headspace GC-MS	E611A	1575084	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601.SG	1577148	1	7	14.2	5.0	✓
Metals in Soil/Solid by CRC ICPMS	E440	1579209	1	20	5.0	5.0	✓
Moisture Content by Gravimetry	E144	1577149	1	20	5.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	1575085	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
BTEX by Headspace GC-MS	E611A	1575084	1	20	5.0	5.0	✓
CCME PHCs - F2-F4 by GC-FID	E601.SG	1577148	1	7	14.2	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Moisture Content by Gravimetry	E144 ALS Environmental - Calgary	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Metals in Soil/Solid by CRC ICPMS	E440 ALS Environmental - Calgary	Soil/Solid	EPA 6020B (mod)	This method is intended to liberate metals that may be environmentally available. Samples are dried, then sieved through a 2 mm sieve, and digested with HNO₃ and HCl. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Silicate minerals are not solubilized. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. This method does not adequately recover elemental sulfur, and is unsuitable for assessment of elemental sulfur standards or guidelines. Analysis is by Collision/Reaction Cell ICPMS.
VH and F1 by Headspace GC-FID	E581.VH+F1 ALS Environmental - Calgary	Soil/Solid	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law. Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
CCME PHCs - F2-F4 by GC-FID	E601.SG ALS Environmental - Calgary	Soil/Solid	CCME PHC in Soil - Tier 1	Sample extracts are subjected to in-situ silica gel treatment prior to analysis by GC-FID for CCME hydrocarbon fractions (F2-F4). Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Test results are expressed on a dry weight basis. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BTEX by Headspace GC-MS	E611A ALS Environmental - Calgary	Soil/Solid	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions

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 Work Order : YL2401032
 Client : Government of the Northwest Territories
 Project : ----



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Metals and Mercury	EP440 ALS Environmental - Calgary	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO ₃ and HCl. This method is intended to liberate metals that may be environmentally available.
VOCs Methanol Extraction for Headspace Analysis	EP581 ALS Environmental - Calgary	Soil/Solid	EPA 5035A (mod)	VOCs in samples are extracted with methanol. Extracts are then prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PHCs and PAHs Hexane-Acetone Tumbler Extraction	EP601 ALS Environmental - Calgary	Soil/Solid	CCME PHC in Soil - Tier 1 (mod)	Samples are subsampled and Petroleum Hydrocarbons (PHC) and PAHs are extracted with 1:1 hexane:acetone using a rotary extractor.

QUALITY CONTROL REPORT

Work Order	: YL2401032	Page	: 1 of 11
Client	: Government of the Northwest Territories	Laboratory	: ALS Environmental - Yellowknife
Contact	: Judy Mah	Account Manager	: Oliver Gregg
Address	: Taiga Environmental Lab 4601 52 Ave Yellowknife NT Canada X1A 2L9	Address	: 314 Old Airport Road, Unit 116 Yellowknife, Northwest Territories Canada X1A 3T3
Telephone	: 867 765 6638	Telephone	: 1 867 445 7143
Project	: ----	Date Samples Received	: 29-Jul-2024 16:30
PO	: 3913	Date Analysis Commenced	: 01-Aug-2024
C-O-C number	: ----	Issue Date	: 06-Aug-2024 10:59
Sampler	: ----		
Site	: ----		
Quote number	: YL23-GPNT100-001		
No. of samples received	: 4		
No. of samples analysed	: 4		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Reference Material (RM) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Cynthia Bauer	Organic Supervisor	Calgary Organics, Calgary, Alberta
Harpreet Chawla	Team Leader - Inorganics	Calgary Metals, Calgary, Alberta
Maqsood UlHassan	Laboratory Analyst	Calgary Organics, Calgary, Alberta
Marsha Calero	Laboratory Assistant	Calgary Organics, Calgary, Alberta

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Work Order : YL2401032
Client : Government of the Northwest Territories
Project : ----



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Soil/Solid					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1577149)											
FJ2402173-001	Anonymous	Moisture	----	E144	0.25	%	22.0	22.7	3.23%	20%	----
Metals (QC Lot: 1579209)											
CG2410547-008	Anonymous	Aluminum	7429-90-5	E440	50	mg/kg	2510	2440	3.18%	40%	----
		Antimony	7440-36-0	E440	0.10	mg/kg	0.14	0.14	0.002	Diff <2x LOR	----
		Arsenic	7440-38-2	E440	0.10	mg/kg	2.74	2.66	2.99%	30%	----
		Barium	7440-39-3	E440	0.50	mg/kg	134	126	6.05%	40%	----
		Beryllium	7440-41-7	E440	0.10	mg/kg	0.24	0.24	0.005	Diff <2x LOR	----
		Bismuth	7440-69-9	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		Boron	7440-42-8	E440	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
		Cadmium	7440-43-9	E440	0.020	mg/kg	0.144	0.136	5.43%	30%	----
		Calcium	7440-70-2	E440	50	mg/kg	11500	11500	0.207%	30%	----
		Chromium	7440-47-3	E440	0.50	mg/kg	3.14	2.98	0.17	Diff <2x LOR	----
		Cobalt	7440-48-4	E440	0.10	mg/kg	2.62	2.59	1.13%	30%	----
		Copper	7440-50-8	E440	0.50	mg/kg	9.92	9.58	3.44%	30%	----
		Iron	7439-89-6	E440	50	mg/kg	3500	3480	0.741%	30%	----
		Lead	7439-92-1	E440	0.50	mg/kg	4.38	4.33	1.02%	40%	----
		Lithium	7439-93-2	E440	2.0	mg/kg	3.2	3.1	0.1	Diff <2x LOR	----
		Magnesium	7439-95-4	E440	20	mg/kg	1560	1510	3.41%	30%	----
		Manganese	7439-96-5	E440	1.0	mg/kg	190	187	1.30%	30%	----
		Molybdenum	7439-98-7	E440	0.10	mg/kg	0.85	0.83	2.58%	40%	----
		Nickel	7440-02-0	E440	0.50	mg/kg	6.20	5.92	4.49%	30%	----
		Phosphorus	7723-14-0	E440	50	mg/kg	307	307	0.008	Diff <2x LOR	----
		Potassium	7440-09-7	E440	100	mg/kg	440	430	10	Diff <2x LOR	----
		Selenium	7782-49-2	E440	0.20	mg/kg	0.56	0.54	0.01	Diff <2x LOR	----
		Silver	7440-22-4	E440	0.10	mg/kg	<0.10	<0.10	0	Diff <2x LOR	----
		Sodium	7440-23-5	E440	50	mg/kg	152	149	3	Diff <2x LOR	----
		Strontium	7440-24-6	E440	0.50	mg/kg	74.1	73.1	1.43%	40%	----
		Sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	0	Diff <2x LOR	----
		Thallium	7440-28-0	E440	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----



Sub-Matrix: Soil/Solid					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Metals (QC Lot: 1579209) - continued											
CG2410547-008	Anonymous	Titanium	7440-32-6	E440	1.0	mg/kg	2.2	2.0	0.2	Diff <2x LOR	----
		Tungsten	7440-33-7	E440	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		Uranium	7440-61-1	E440	0.050	mg/kg	0.408	0.406	0.350%	30%	----
		Vanadium	7440-62-2	E440	0.20	mg/kg	8.08	8.02	0.698%	30%	----
		Zinc	7440-66-6	E440	2.0	mg/kg	21.8	21.0	3.46%	30%	----
		Zirconium	7440-67-7	E440	1.0	mg/kg	<1.0	<1.0	0	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1575084)											
FJ2402173-001	Anonymous	Benzene	71-43-2	E611A	0.0054	mg/kg	0.0104	0.0092	0.0012	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	<0.015	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.040	mg/kg	<0.040	<0.040	0	Diff <2x LOR	----
		Styrene	100-42-5	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.050	mg/kg	<0.050	<0.050	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.030	mg/kg	<0.030	<0.030	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1575085)											
FJ2402173-001	Anonymous	F1 (C6-C10)	----	E581.VH+F1	5.0	mg/kg	<5.0	<5.0	0	Diff <2x LOR	----
		VHs (C6-C10)	----	E581.VH+F1	10	mg/kg	<10	<10	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1577148)											
YL2401022-014	Anonymous	F2 (C10-C16)	----	E601.SG	30	mg/kg	754	850	11.9%	40%	----
		F3 (C16-C34)	----	E601.SG	50	mg/kg	2210	2630	17.4%	40%	----
		F4 (C34-C50)	----	E601.SG	50	mg/kg	464	537	14.7%	40%	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1577149)						
Moisture	----	E144	0.25	%	<0.25	----
Metals (QCLot: 1579209)						
Aluminum	7429-90-5	E440	50	mg/kg	<50	----
Antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
Arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
Barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
Beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
Bismuth	7440-69-9	E440	0.2	mg/kg	<0.20	----
Boron	7440-42-8	E440	5	mg/kg	<5.0	----
Cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
Calcium	7440-70-2	E440	50	mg/kg	<50	----
Chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
Cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
Copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
Iron	7439-89-6	E440	50	mg/kg	<50	----
Lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
Lithium	7439-93-2	E440	2	mg/kg	<2.0	----
Magnesium	7439-95-4	E440	20	mg/kg	<20	----
Manganese	7439-96-5	E440	1	mg/kg	<1.0	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
Nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
Phosphorus	7723-14-0	E440	50	mg/kg	<50	----
Potassium	7440-09-7	E440	100	mg/kg	<100	----
Selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
Silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
Sodium	7440-23-5	E440	50	mg/kg	<50	----
Strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
Sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
Thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
Tin	7440-31-5	E440	2	mg/kg	<2.0	----
Titanium	7440-32-6	E440	1	mg/kg	<1.0	----
Tungsten	7440-33-7	E440	0.5	mg/kg	<0.50	----

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 Work Order : YL2401032
 Client : Government of the Northwest Territories
 Project : ----



Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 1579209) - continued						
Uranium	7440-61-1	E440	0.05	mg/kg	<0.050	----
Vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	----
Zinc	7440-66-6	E440	2	mg/kg	<2.0	----
Zirconium	7440-67-7	E440	1	mg/kg	<1.0	----
Volatile Organic Compounds (QCLot: 1575084)						
Benzene	71-43-2	E611A	0.005	mg/kg	<0.0050	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	<0.015	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.04	mg/kg	<0.040	----
Styrene	100-42-5	E611A	0.05	mg/kg	<0.050	----
Toluene	108-88-3	E611A	0.05	mg/kg	<0.050	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	<0.030	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	<0.030	----
Hydrocarbons (QCLot: 1575085)						
F1 (C6-C10)	----	E581.VH+F1	5	mg/kg	<5.0	----
VHs (C6-C10)	----	E581.VH+F1	10	mg/kg	<10	----
Hydrocarbons (QCLot: 1577148)						
F2 (C10-C16)	----	E601.SG	25	mg/kg	<25	----
F3 (C16-C34)	----	E601.SG	50	mg/kg	<50	----
F4 (C34-C50)	----	E601.SG	50	mg/kg	<50	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Soil/Solid

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1577149)									
Moisture	----	E144	0.25	%	50 %	96.0	90.0	110	----
Metals (QCLot: 1579209)									
Aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	104	80.0	120	----
Antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	99.1	80.0	120	----
Arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	106	80.0	120	----
Barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	102	80.0	120	----
Beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	98.8	80.0	120	----
Bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	96.6	80.0	120	----
Boron	7440-42-8	E440	5	mg/kg	100 mg/kg	99.0	80.0	120	----
Cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	102	80.0	120	----
Calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	99.0	80.0	120	----
Chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	102	80.0	120	----
Cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	100	80.0	120	----
Copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	99.2	80.0	120	----
Iron	7439-89-6	E440	50	mg/kg	100 mg/kg	98.8	80.0	120	----
Lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	99.9	80.0	120	----
Lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	105	80.0	120	----
Magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	110	80.0	120	----
Manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	100	80.0	120	----
Molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	98.8	80.0	120	----
Nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	101	80.0	120	----
Phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	104	80.0	120	----
Potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	104	80.0	120	----
Selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	94.5	80.0	120	----
Silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	92.7	80.0	120	----
Sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	103	80.0	120	----
Strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	98.5	80.0	120	----
Sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	99.4	80.0	120	----
Thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	97.1	80.0	120	----
Tin	7440-31-5	E440	2	mg/kg	50 mg/kg	99.1	80.0	120	----
Titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	100	80.0	120	----
Tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	97.5	80.0	120	----



Sub-Matrix: Soil/Solid					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 1579209) - continued									
Uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	99.0	80.0	120	----
Vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	104	80.0	120	----
Zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	99.5	80.0	120	----
Zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	98.6	80.0	120	----
Volatile Organic Compounds (QCLot: 1575084)									
Benzene	71-43-2	E611A	0.005	mg/kg	2.5 mg/kg	117	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.015	mg/kg	2.5 mg/kg	102	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.04	mg/kg	2.5 mg/kg	112	70.0	130	----
Styrene	100-42-5	E611A	0.05	mg/kg	2.5 mg/kg	100	70.0	130	----
Toluene	108-88-3	E611A	0.05	mg/kg	2.5 mg/kg	109	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.03	mg/kg	5 mg/kg	104	70.0	130	----
Xylene, o-	95-47-6	E611A	0.03	mg/kg	2.5 mg/kg	106	70.0	130	----
Hydrocarbons (QCLot: 1575085)									
F1 (C6-C10)	----	E581.VH+F1	5	mg/kg	75.3 mg/kg	123	70.0	130	----
VHs (C6-C10)	----	E581.VH+F1	10	mg/kg	75.8 mg/kg	116	70.0	130	----
Hydrocarbons (QCLot: 1577148)									
F2 (C10-C16)	----	E601.SG	25	mg/kg	626 mg/kg	74.9	70.0	130	----
F3 (C16-C34)	----	E601.SG	50	mg/kg	1360 mg/kg	70.8	70.0	130	----
F4 (C34-C50)	----	E601.SG	50	mg/kg	750 mg/kg	90.1	70.0	130	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: Soil/Solid

Sub-Matrix: Soil/Solid					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1575084)										
FJ2402173-001	Anonymous	Benzene	71-43-2	E611A	5.81 mg/kg	5.47 mg/kg	106	60.0	140	----
		Ethylbenzene	100-41-4	E611A	5.27 mg/kg	5.47 mg/kg	96.2	60.0	140	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	5.48 mg/kg	5.47 mg/kg	100	60.0	140	----
		Styrene	100-42-5	E611A	5.40 mg/kg	5.47 mg/kg	98.6	60.0	140	----
		Toluene	108-88-3	E611A	5.45 mg/kg	5.47 mg/kg	99.5	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	10.8 mg/kg	10.9 mg/kg	98.5	60.0	140	----
		Xylene, o-	95-47-6	E611A	5.52 mg/kg	5.47 mg/kg	101	60.0	140	----
Hydrocarbons (QCLot: 1577148)										
YL2401022-014	Anonymous	F2 (C10-C16)	----	E601.SG	ND mg/kg	----	ND	60.0	140	----
		F3 (C16-C34)	----	E601.SG	ND mg/kg	----	ND	60.0	140	----
		F4 (C34-C50)	----	E601.SG	482 mg/kg	644 mg/kg	74.9	60.0	140	----



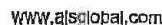
Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

Sub-Matrix:					Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method			Low	High	
Metals (QCLot: 1579209)									
QC-1579209-003	RM	Aluminum	7429-90-5	E440	22500 mg/kg	105	70.0	130	----
QC-1579209-003	RM	Antimony	7440-36-0	E440	24.8 mg/kg	100	70.0	130	----
QC-1579209-003	RM	Arsenic	7440-38-2	E440	21.2 mg/kg	103	70.0	130	----
QC-1579209-003	RM	Barium	7440-39-3	E440	788 mg/kg	102	70.0	130	----
QC-1579209-003	RM	Beryllium	7440-41-7	E440	1.82 mg/kg	104	70.0	130	----
QC-1579209-003	RM	Bismuth	7440-69-9	E440	1.78 mg/kg	87.7	70.0	130	----
QC-1579209-003	RM	Cadmium	7440-43-9	E440	2.15 mg/kg	102	70.0	130	----
QC-1579209-003	RM	Calcium	7440-70-2	E440	4900 mg/kg	103	70.0	130	----
QC-1579209-003	RM	Chromium	7440-47-3	E440	56.9 mg/kg	102	70.0	130	----
QC-1579209-003	RM	Cobalt	7440-48-4	E440	32 mg/kg	102	70.0	130	----
QC-1579209-003	RM	Copper	7440-50-8	E440	969 mg/kg	102	70.0	130	----
QC-1579209-003	RM	Iron	7439-89-6	E440	32700 mg/kg	99.2	70.0	130	----
QC-1579209-003	RM	Lead	7439-92-1	E440	919 mg/kg	98.7	70.0	130	----
QC-1579209-003	RM	Lithium	7439-93-2	E440	47.3 mg/kg	113	70.0	130	----
QC-1579209-003	RM	Magnesium	7439-95-4	E440	7780 mg/kg	107	70.0	130	----
QC-1579209-003	RM	Manganese	7439-96-5	E440	8640 mg/kg	104	70.0	130	----
QC-1579209-003	RM	Molybdenum	7439-98-7	E440	25.1 mg/kg	99.4	70.0	130	----
QC-1579209-003	RM	Nickel	7440-02-0	E440	1000 mg/kg	101	70.0	130	----
QC-1579209-003	RM	Phosphorus	7723-14-0	E440	660 mg/kg	103	70.0	130	----
QC-1579209-003	RM	Potassium	7440-09-7	E440	10800 mg/kg	105	70.0	130	----
QC-1579209-003	RM	Selenium	7782-49-2	E440	1.04 mg/kg	92.8	60.0	140	----
QC-1579209-003	RM	Silver	7440-22-4	E440	8.98 mg/kg	97.0	70.0	130	----
QC-1579209-003	RM	Sodium	7440-23-5	E440	1770 mg/kg	108	70.0	130	----
QC-1579209-003	RM	Strontium	7440-24-6	E440	41 mg/kg	94.7	70.0	130	----
QC-1579209-003	RM	Sulfur	7704-34-9	E440	3940 mg/kg	102	50.0	150	----
QC-1579209-003	RM	Thallium	7440-28-0	E440	0.907 mg/kg	100	70.0	130	----
QC-1579209-003	RM	Tin	7440-31-5	E440	3.79 mg/kg	103	40.0	160	----
QC-1579209-003	RM	Titanium	7440-32-6	E440	2790 mg/kg	109	70.0	130	----
QC-1579209-003	RM	Tungsten	7440-33-7	E440	6.99 mg/kg	113	70.0	130	----
QC-1579209-003	RM	Uranium	7440-61-1	E440	3.97 mg/kg	97.8	70.0	130	----
QC-1579209-003	RM	Vanadium	7440-62-2	E440	66.2 mg/kg	104	70.0	130	----
QC-1579209-003	RM	Zinc	7440-66-6	E440	828 mg/kg	102	70.0	130	----
QC-1579209-003	RM	Zirconium	7440-67-7	E440	6.91 mg/kg	119	70.0	130	----





COC Number: 21 -

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Canada Toll Free: 1 800 668 9878

Report To		Reports / Recipients		Turnaround Time (TAT) Requested		AFFIX ALS BARCODE LABEL (ALS use only)
Company: GNWT - ENR, Taiga Laboratory		Select Report Format: ☒ PDF ☒ EXCEL ☐ EDD (DIGITAL)		☒ Routine [R] If received by 3pm M-F - no surcharges apply		
Contact: Judy Mah		Merge QG/QCI Reports with COA ☐ YES ☐ NO ☐ N/A		☐ 4 day [P4] If received by 3pm M-F - 20% rush surcharge minimum		
Phone: 867-767-9235, Ext 53153		☐ Compare Results to Criteria on Report - provide details below if box checked		☐ 3 day [P3] If received by 3pm M-F - 25% rush surcharge minimum		
Street: 4601 - 52 Ave		Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX		☐ 2 day [P2] If received by 3pm M-F - 50% rush surcharge minimum		
City/Province: Yellowknife, NT		Email 1 or Fax: judy_mah@gov.nt.ca		☐ 1 day [E] If received by 3pm M-F - 100% rush surcharge minimum		
Postal Code: X1A 1L4		Email 2:		☐ Same day [E2] If received by 10am M-S - 200% rush surcharge.		
Invoice To: Same as Report To ☒ YES ☐ NO		Invoice Recipients		Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests		
Copy of Invoice with Report ☐ YES ☐ NO		Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX		Date and Time Required for all E&P TATs:		
Company:		Email 1 or Fax:		For all tests with rush TATs requested, please contact your AM to confirm availability.		
Contact:		Email 2:		Analysis Request		
Project Information		Oil and Gas Required Fields (client use)		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below		
ALS Account # / Quote #:		AFE/Cost Center:		NUMBER OF CONTAINERS		SAMPLES ON HOLD
Job #:		Major/Minor Code:		BTX		
PO / AFE:		Requisitioner:		F1		
LSD:		Location:		F2, F3, F4		
ALS Lab Work Order # (ALS use only):		ALS Contact:		Metals		
ALS Sample # (ALS use only)		Date (dd-mm-yy)		Time (hh:mm)		Environmental Division Yellowknife Work Order Reference YL2401032
Sample Identification and/or Coordinates (This description will appear on the report)		Time		Sample Type		
241120-001 → 004		26 July 24		Soil		
Drinking Water (DW) Samples¹ (client use)		Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)		SAMPLE RECEIPT DETAILS (ALS use only)		Telephone: +1 867 873 5593
Are samples taken from a Regulated DW System? ☐ YES ☐ NO				Cooling Method: ☐ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING PANTS		
Are samples for human consumption/ use? ☐ YES ☐ NO				Submission Comments Identified on Sample Receipt Notification: ☐ YES ☐ NO		
				Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES		
				INITIAL COOLER TEMPERATURES °C: FINAL COOLER TEMPERATURES °C:		
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (ALS use only)		FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:		Date:		Received by:		
Time:		Date:		Time:		

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

**ANNUAL REPORT
FOR THE KUGAARUK LANDFARM**

Appendix B: CIRNAC Inspection Report

The CIRNAC inspection did not take place in 2024.