



Elan Chalmers
Municipal Planning Officer
Government of Nunavut
Community and Government Services
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ANNUAL REPORT FOR THE KUGAARUK LANDFARM

YEAR BEING REPORTED: 2020

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

None

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

No new soil was placed into the landfarm in 2020.

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

None

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

None

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

None

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;

- Photographs of the site are available in the 2019 and 2020 CIRNAC inspection reports. New photographs will be taken by CGS when on site in 2021. Progressive reclamation continues as in previous years, final reclamation has not started at this time.

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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 August 24, 2020 (mg/L)
pH	6.5-9	8.07
TSS	50	<3
Oil and Grease	15 and no visible sheen	-
Total Lead	0.001	0.0002
Benzene	0.37	<0.0005
Toluene	0.002	<0.0005
Ethylbenzene	0.09	<0.0005

Table 2. Monitoring Program Station SW1 Effluent Results

Parameters	Unit	SW1 August 24, 2020
pH		7.3
TSS	mg/L	4
Chloride	mg/L	2.8
Nitrate+Nitrite as Nitrogen	mg/L	0.06
Sulphate	mg/L	3
HC Extractable	mg/L	0.6
Calcium	µg/L	112
Magnesium	mg/L	18.9
Potassium	mg/L	6.31
Sodium	mg/L	8.73
Benzene	mg/L	<0.0005
Ethylbenzene	mg/L	<0.0005
Toluene	mg/L	<0.0005
Xylenes	mg/L	0.00227
Aluminium	µg/L	124
Arsenic	µg/L	1.4
Cadmium	µg/L	<0.1
Chromium	µg/L	0.8
Cobalt	µg/L	0.3
Copper	µg/L	0.9

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Iron	µg/L	1200
Lead	µg/L	0.2
Manganese	µg/L	728
Mercury	µg/L	<0.01
Nickel	µg/L	1.5
Zinc	µg/L	<5
Total Phenol	mg/L	-
Hardness	mg/L	-
PAH	mg/L	-
Conductivity	mg/L	-
Ammonia Nitrogen	mg/L	-
Oil and grease (visual)	mg/L	-
Alkalinity	mg/L	-
Phosphorous	mg/L	-

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

	CCME Guideline for Industrial Land Use	August 24, 2020 (ppm)			
Parameter	Coarse (ppm)	LF-1	LF-2	LF-3	LF-4
Benzene	0.03	<0.005	<0.005	<0.005	<0.005
Toluene	0.37	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.082	<0.01	<0.01	<0.01	<0.01
Xylenes	11	<0.1	<0.1	<0.1	<0.1
F1	320	<10	<10	<10	<10
F2	260	48	55	92	<20
F3	1700	4430	3940	4510	47
F4	3300	807	709	779	<20
Lead	600	3.4	3.62	6.59	3.84

- The retention cell holds approximately 1350 m³ of water while maintaining freeboard. It is assumed that this is the amount of effluent that is discharged each year.
- 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;

- None

h) A summary of public consultation/participation, describing consultation with local organizations and residents of the nearby communities, if any were conducted;

- None

i) Any other details on Waste disposal requested by the Board by the 1st November of the year being reported.

- None

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:

- None

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:

- The updated O&M Plan and Spill Contingency Plan each were submitted to NWB in January 2021.

List of Appendices

Appendix A: Laboratory Certificate of Analysis – August 24, 2021 – 16 pages

Appendix B: CIRNAC Inspection Report - 6 pages

**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.:
200655

- FINAL REPORT -

Prepared For: Hamlet of Kugaaruk

Address: Box 205
Kugaaruk, NU, X0B 1K0

Attn: Chantal Dowden

Facsimile: 867-769-6069

Final report has been reviewed and approved by:

Glen Hudy
Quality Assurance Officer

NOTES:

- Test methods and data are validated by the laboratory's Quality Assurance Program. Taiga Environmental Laboratory is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) to ISO/IEC 17025 as a testing laboratory for specific tests registered with CALA.
- Routine methods are based on recognized procedures from sources such as
 - Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
 - Environment Canada
 - USEPA
- Samples shall be kept for thirty (30) days after the final report is issued. All microbiological samples shall be disposed of immediately upon completion of analysis to minimize biohazardous risks to laboratory personnel. Please contact the laboratory if you have any special requirements.
- Final results are based on the specific tests at the time of analysis and do not represent the conditions during sampling.

ReportDate: Wednesday, September 16, 2020

Print Date: *Wednesday, September 16, 2020*

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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.:
200655

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **LF-1**

Taiga Sample ID: **001**

Client Project: Kugaaruk Soil Land Farm

Sample Type: HC Contaminated Soil

Received Date: 26-Aug-20

Sampling Date: 24-Aug-20

Sampling Time: 9:00

Location: Soil Pad Stations LF1-LF4, and ponds SW1,
SW2

Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
Subcontracted Metals						
Aluminum	3070	50	mg/kg	03-Sep-20	EPA200.2	
Arsenic	1.10	0.1	mg/kg	03-Sep-20	EPA200.2	
Barium	14.0	0.5	mg/kg	03-Sep-20	EPA200.2	
Beryllium	0.15	0.1	mg/kg	03-Sep-20	EPA200.2	
Cadmium	< 0.020	0.02	mg/kg	03-Sep-20	EPA200.2	
Chromium	7.55	0.5	mg/kg	03-Sep-20	EPA200.2	
Copper	2.97	0.5	mg/kg	03-Sep-20	EPA200.2	
Iron	6610	50	mg/kg	03-Sep-20	EPA200.2	
Lead	3.40	0.5	mg/kg	03-Sep-20	EPA200.2	
Manganese	70.5	1	mg/kg	03-Sep-20	EPA200.2	
Mercury	< 0.0050	0.005	mg/kg	04-Sep-20	EPA200.2/6020A	
Nickel	4.12	0.5	mg/kg	03-Sep-20	EPA200.2	
Selenium	< 0.20	0.2	mg/kg	03-Sep-20	EPA200.2	
Silver	< 0.10	0.1	mg/kg	03-Sep-20	EPA200.2	

ReportDate: Wednesday, September 16, 2020

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

Taiga Batch No.:
200655

- CERTIFICATE OF ANALYSIS -

Client Sample ID: LF-1

Taiga Sample ID: 001

Tin	< 2.0	2	mg/kg	03-Sep-20	EPA200.2
Uranium	1.24	0.05	mg/kg	03-Sep-20	EPA200.2
Vanadium	12.1	0.2	mg/kg	03-Sep-20	EPA200.2
Zinc	12.6	2	mg/kg	03-Sep-20	EPA200.2

Subcontracted Organics

Benzene	< 0.0050	0.005	mg/kg	28-Aug-20	CCME CWS PHC
Ethylbenzene	< 0.010	0.010	mg/kg	28-Aug-20	CCME CWS PHC
F1: C6-C10	< 10	10	mg/kg	02-Sep-20	CCME CWS PHC
F2: C10-C16	48	20	mg/kg	02-Sep-20	CCME CWS PHC
F3: C16-C34	4430	20	mg/kg	02-Sep-20	CCME CWS PHC
F4: C34-C50	807	20	mg/kg	02-Sep-20	CCME CWS PHC
Toluene	< 0.050	0.05	mg/kg	28-Aug-20	CCME CWS PHC
Xylenes	< 0.100	0.10	mg/kg	28-Aug-20	CCME CWS PHC

ReportDate: Wednesday, September 16, 2020

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

Taiga Batch No.:

200655

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **LF-2**

Taiga Sample ID: **002**

Client Project: Kugaaruk Soil Land Farm

Sample Type: HC Contaminated Soil

Received Date: 26-Aug-20

Sampling Date: 24-Aug-20

Sampling Time: 9:00

Location: Soil Pad Stations LF1-LF4, and ponds SW1, SW2

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
Subcontracted Metals						
Aluminum	4950	50	mg/kg	03-Sep-20	EPA200.2	
Arsenic	1.16	0.1	mg/kg	03-Sep-20	EPA200.2	
Barium	22.5	0.5	mg/kg	03-Sep-20	EPA200.2	
Beryllium	0.25	0.1	mg/kg	03-Sep-20	EPA200.2	
Cadmium	< 0.020	0.02	mg/kg	03-Sep-20	EPA200.2	
Chromium	12.1	0.5	mg/kg	03-Sep-20	EPA200.2	
Copper	4.11	0.5	mg/kg	03-Sep-20	EPA200.2	
Iron	9290	50	mg/kg	03-Sep-20	EPA200.2	
Lead	3.62	0.5	mg/kg	03-Sep-20	EPA200.2	
Manganese	101	1	mg/kg	03-Sep-20	EPA200.2	
Mercury	< 0.0050	0.005	mg/kg	04-Sep-20	EPA200.2/6020A	
Nickel	6.37	0.5	mg/kg	03-Sep-20	EPA200.2	
Selenium	< 0.20	0.2	mg/kg	03-Sep-20	EPA200.2	
Silver	< 0.10	0.1	mg/kg	03-Sep-20	EPA200.2	
Tin	< 2.0	2	mg/kg	03-Sep-20	EPA200.2	

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Taiga Batch No.:
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- CERTIFICATE OF ANALYSIS -

Client Sample ID: LF-2

Taiga Sample ID: 002

Uranium	1.25	0.05	mg/kg	03-Sep-20	EPA200.2
Vanadium	16.7	0.2	mg/kg	03-Sep-20	EPA200.2
Zinc	19.0	2	mg/kg	03-Sep-20	EPA200.2

Subcontracted Organics

Benzene	< 0.0050	0.005	mg/kg	28-Aug-20	CCME CWS PHC
Ethylbenzene	< 0.010	0.010	mg/kg	28-Aug-20	CCME CWS PHC
F1: C6-C10	< 10	10	mg/kg	02-Sep-20	CCME CWS PHC
F2: C10-C16	55	20	mg/kg	02-Sep-20	CCME CWS PHC
F3: C16-C34	3940	20	mg/kg	02-Sep-20	CCME CWS PHC
F4: C34-C50	709	20	mg/kg	02-Sep-20	CCME CWS PHC
Toluene	< 0.050	0.05	mg/kg	28-Aug-20	CCME CWS PHC
Xylenes	< 0.100	0.10	mg/kg	28-Aug-20	CCME CWS PHC

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Taiga Batch No.:

200655

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **LF-3**

Taiga Sample ID: **003**

Client Project: Kugaaruk Soil Land Farm

Sample Type: HC Contaminated Soil

Received Date: 26-Aug-20

Sampling Date: 24-Aug-20

Sampling Time: 9:00

Location: Soil Pad Stations LF1-LF4, and ponds SW1, SW2

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
Subcontracted Metals						
Aluminum	7020	50	mg/kg	03-Sep-20	EPA200.2	
Arsenic	1.92	0.1	mg/kg	03-Sep-20	EPA200.2	
Barium	13.9	0.5	mg/kg	03-Sep-20	EPA200.2	
Beryllium	0.63	0.1	mg/kg	03-Sep-20	EPA200.2	
Cadmium	0.215	0.02	mg/kg	03-Sep-20	EPA200.2	
Chromium	13.0	0.5	mg/kg	03-Sep-20	EPA200.2	
Copper	9.97	0.5	mg/kg	03-Sep-20	EPA200.2	
Iron	16100	50	mg/kg	03-Sep-20	EPA200.2	
Lead	6.59	0.5	mg/kg	03-Sep-20	EPA200.2	
Manganese	227	1	mg/kg	03-Sep-20	EPA200.2	
Mercury	0.0132	0.005	mg/kg	04-Sep-20	EPA200.2/6020A	
Nickel	6.67	0.5	mg/kg	03-Sep-20	EPA200.2	
Selenium	< 0.20	0.2	mg/kg	03-Sep-20	EPA200.2	
Silver	< 0.10	0.1	mg/kg	03-Sep-20	EPA200.2	
Tin	< 2.0	2	mg/kg	03-Sep-20	EPA200.2	

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Taiga Batch No.:
200655

- CERTIFICATE OF ANALYSIS -

Client Sample ID: LF-3

Taiga Sample ID: 003

Uranium	4.57	0.05	mg/kg	03-Sep-20	EPA200.2
Vanadium	28.1	0.2	mg/kg	03-Sep-20	EPA200.2
Zinc	71.5	2	mg/kg	03-Sep-20	EPA200.2

Subcontracted Organics

Benzene	< 0.0050	0.005	mg/kg	28-Sep-20	CCME CWS PHC
Ethylbenzene	< 0.010	0.010	mg/kg	28-Sep-20	CCME CWS PHC
F1: C6-C10	< 10	10	mg/kg	02-Sep-20	CCME CWS PHC
F2: C10-C16	92	20	mg/kg	02-Sep-20	CCME CWS PHC
F3: C16-C34	4510	20	mg/kg	02-Sep-20	CCME CWS PHC
F4: C34-C50	779	20	mg/kg	02-Sep-20	CCME CWS PHC
Toluene	< 0.050	0.05	mg/kg	28-Sep-20	CCME CWS PHC
Xylenes	< 0.100	0.10	mg/kg	28-Sep-20	CCME CWS PHC

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Taiga Batch No.:

200655

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **LF-4**

Taiga Sample ID: **004**

Client Project: Kugaaruk Soil Land Farm

Sample Type: HC Contaminated Soil

Received Date: 26-Aug-20

Sampling Date: 24-Aug-20

Sampling Time: 9:00

Location: Soil Pad Stations LF1-LF4, and ponds SW1, SW2

Report Status: Final

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
Subcontracted Metals						
Aluminum	5070	50	mg/kg	03-Sep-20	EPA200.2	
Arsenic	1.72	0.1	mg/kg	03-Sep-20	EPA200.2	
Barium	20.8	0.5	mg/kg	03-Sep-20	EPA200.2	
Beryllium	0.30	0.1	mg/kg	03-Sep-20	EPA200.2	
Cadmium	0.021	0.02	mg/kg	03-Sep-20	EPA200.2	
Chromium	13.7	0.5	mg/kg	03-Sep-20	EPA200.2	
Copper	4.19	0.5	mg/kg	03-Sep-20	EPA200.2	
Iron	11100	50	mg/kg	03-Sep-20	EPA200.2	
Lead	3.84	0.5	mg/kg	03-Sep-20	EPA200.2	
Manganese	151	1	mg/kg	03-Sep-20	EPA200.2	
Mercury	0.0051	0.005	mg/kg	04-Sep-20	EPA200.2/6020A	
Nickel	6.43	0.5	mg/kg	03-Sep-20	EPA200.2	
Selenium	< 0.20	0.2	mg/kg	03-Sep-20	EPA200.2	
Silver	< 0.10	0.1	mg/kg	03-Sep-20	EPA200.2	
Tin	< 2.0	2	mg/kg	03-Sep-20	EPA200.2	

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Taiga Batch No.:
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- CERTIFICATE OF ANALYSIS -

Client Sample ID: LF-4

Taiga Sample ID: 004

Uranium	2.08	0.05	mg/kg	03-Sep-20	EPA200.2
Vanadium	19.0	0.2	mg/kg	03-Sep-20	EPA200.2
Zinc	20.8	2	mg/kg	03-Sep-20	EPA200.2

Subcontracted Organics

Benzene	< 0.0050	0.005	mg/kg	28-Aug-20	CCME CWS PHC
Ethylbenzene	< 0.010	0.010	mg/kg	28-Aug-20	CCME CWS PHC
F1: C6-C10	< 10	10	mg/kg	02-Sep-20	CCME CWS PHC
F2: C10-C16	< 20	20	mg/kg	02-Sep-20	CCME CWS PHC
F3: C16-C34	47	20	mg/kg	02-Sep-20	CCME CWS PHC
F4: C34-C50	< 20	20	mg/kg	02-Sep-20	CCME CWS PHC
Toluene	< 0.050	0.05	mg/kg	28-Aug-20	CCME CWS PHC
Xylenes	< 0.100	0.10	mg/kg	28-Aug-20	CCME CWS PHC

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

Taiga Batch No.:
200655

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **SW-1**

Taiga Sample ID: **005**

Client Project: Kugaaruk Soil Land Farm

Sample Type: Soil Wash Water

Received Date: 26-Aug-20

Sampling Date: 24-Aug-20

Sampling Time: 9:00

Location: Soil Pad Stations LF1-LF4, and ponds SW1,
SW2

Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Inorganics - Physicals</u>						
Alkalinity, Total (as CaCO ₃)	371	0.4	mg/L	26-Aug-20	SM2320:B	
pH	7.30		pH units	26-Aug-20	SM4500-H:B	
Solids, Total Suspended	4	3	mg/L	28-Aug-20	SM2540:D	
<u>Major Ions</u>						
Chloride	2.8	0.7	mg/L	26-Aug-20	SM4110:B	
Nitrate+Nitrite as Nitrogen	0.06	0.01	mg/L	26-Aug-20	SM4110:B	
Sulphate	3	1	mg/L	26-Aug-20	SM4110:B	
<u>Organics</u>						
F2: C10-C16	0.5	0.2	mg/L	02-Sep-20	EPA8015B	222
F3: C16-C34	< 0.2	0.2	mg/L	02-Sep-20	EPA8015B	222
F4: C34-C50	< 0.2	0.2	mg/L	02-Sep-20	EPA8015B	222
Hydrocarbons, Total Extractable	0.6	0.2	mg/L	02-Sep-20	EPA8015B	222
<u>Subcontracted Inorganics</u>						
Calcium	112	0.05	mg/L	02-Sep-20	EPA200.2	
Magnesium	18.9	0.005	mg/L	02-Sep-20	EPA200.2	

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- CERTIFICATE OF ANALYSIS -

Client Sample ID: **SW-1**

Taiga Sample ID: **005**

Potassium	6.31	0.05	mg/L	02-Sep-20	EPA200.2
Sodium	8.73	0.05	mg/L	02-Sep-20	EPA200.2

Subcontracted Organics

Benzene	< 0.00050	0.0005	mg/L	28-Aug-20	EPA 5021
Ethylbenzene	< 0.00050	0.0005	mg/L	28-Aug-20	EPA 5021
F1: C6-C10	< 0.10	0.1	mg/L	02-Sep-20	CCME CWS PHC
Toluene	< 0.00050	0.0005	mg/L	28-Aug-20	EPA 5021
Xylenes	0.00227	0.00071	mg/L	28-Aug-20	EPA 5021

Trace Metals, Total

Aluminum	124	5	µg/L	03-Sep-20	EPA200.8
Antimony	0.2	0.1	µg/L	03-Sep-20	EPA200.8
Arsenic	1.4	0.2	µg/L	03-Sep-20	EPA200.8
Barium	20.9	0.1	µg/L	03-Sep-20	EPA200.8
Beryllium	< 0.1	0.1	µg/L	03-Sep-20	EPA200.8
Bismuth	< 0.2	0.2	µg/L	03-Sep-20	EPA200.8
Boron	130	0.9	µg/L	03-Sep-20	EPA200.8
Cadmium	< 0.1	0.1	µg/L	03-Sep-20	EPA200.8
Cesium	< 0.1	0.1	µg/L	03-Sep-20	EPA200.8
Chromium	0.8	0.1	µg/L	03-Sep-20	EPA200.8
Cobalt	0.3	0.1	µg/L	03-Sep-20	EPA200.8
Copper	0.9	0.2	µg/L	03-Sep-20	EPA200.8
Iron	1200	5	µg/L	03-Sep-20	EPA200.8
Lead	0.2	0.1	µg/L	03-Sep-20	EPA200.8
Lithium	4.8	0.2	µg/L	03-Sep-20	EPA200.8
Manganese	728	0.1	µg/L	03-Sep-20	EPA200.8

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Taiga Batch No.:
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- CERTIFICATE OF ANALYSIS -

Client Sample ID: SW-1

Taiga Sample ID: 005

Mercury	< 0.01	0.01	µg/L	03-Sep-20	EPA200.8
Molybdenum	1.6	0.1	µg/L	03-Sep-20	EPA200.8
Nickel	1.5	0.1	µg/L	03-Sep-20	EPA200.8
Rubidium	3.1	0.1	µg/L	03-Sep-20	EPA200.8
Selenium	< 0.5	0.5	µg/L	03-Sep-20	EPA200.8
Silver	< 0.1	0.1	µg/L	03-Sep-20	EPA200.8
Strontium	515	0.1	µg/L	03-Sep-20	EPA200.8
Thallium	< 0.1	0.1	µg/L	03-Sep-20	EPA200.8
Tin	< 0.1	0.1	µg/L	03-Sep-20	EPA200.8
Titanium	10.8	0.1	µg/L	03-Sep-20	EPA200.8
Uranium	13.6	0.1	µg/L	03-Sep-20	EPA200.8
Vanadium	1.3	0.1	µg/L	03-Sep-20	EPA200.8
Zinc	< 5.0	5	µg/L	03-Sep-20	EPA200.8

ReportDate: Wednesday, September 16, 2020

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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.:
200655

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **SW-2**

Taiga Sample ID: **006**

Client Project: Kugaaruk Soil Land Farm

Sample Type: Soil Wash Winter Pond

Received Date: 26-Aug-20

Sampling Date: 24-Aug-20

Sampling Time: 9:00

Location: Soil Pad Stations LF1-LF4, and ponds SW1,
SW2

Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifier
<u>Inorganics - Physicals</u>						
Alkalinity, Total (as CaCO ₃)	114	0.4	mg/L	26-Aug-20	SM2320:B	
pH	8.07		pH units	26-Aug-20	SM4500-H:B	
Solids, Total Suspended	< 3	3	mg/L	28-Aug-20	SM2540:D	
<u>Major Ions</u>						
Chloride	4.8	0.7	mg/L	26-Aug-20	SM4110:B	
Nitrate+Nitrite as Nitrogen	0.09	0.01	mg/L	26-Aug-20	SM4110:B	
Sulphate	2	1	mg/L	26-Aug-20	SM4110:B	
<u>Organics</u>						
F2: C10-C16	< 0.2	0.2	mg/L	02-Sep-20	EPA8015B	222
F3: C16-C34	< 0.2	0.2	mg/L	02-Sep-20	EPA8015B	222
F4: C34-C50	< 0.2	0.2	mg/L	02-Sep-20	EPA8015B	222
Hydrocarbons, Total Extractable	< 0.2	0.2	mg/L	02-Sep-20	EPA8015B	222
<u>Subcontracted Inorganics</u>						
Calcium	29.8	0.05	mg/L	02-Sep-20	EPA200.2	
Magnesium	7.81	0.005	mg/L	02-Sep-20	EPA200.2	

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

Taiga Batch No.:
200655

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **SW-2**

Taiga Sample ID: **006**

Potassium	3.84	0.05	mg/L	02-Sep-20	EPA200.2
Sodium	7.52	0.05	mg/L	02-Sep-20	EPA200.2

Subcontracted Organics

Benzene	< 0.00050	0.0005	mg/L	02-Sep-20	EPA 5021
Ethylbenzene	< 0.00050	0.0005	mg/L	02-Sep-20	EPA 5021
F1: C6-C10	< 0.10	0.1	mg/L	31-Aug-20	CCME CWS PHC
Toluene	< 0.00050	0.0005	mg/L	02-Sep-20	EPA 5021
Xylenes	< 0.00071	0.00071	mg/L	02-Sep-20	EPA 5021

Trace Metals, Total

Aluminum	81.5	5	µg/L	03-Sep-20	EPA200.8
Antimony	0.1	0.1	µg/L	03-Sep-20	EPA200.8
Arsenic	0.8	0.2	µg/L	03-Sep-20	EPA200.8
Barium	6.6	0.1	µg/L	03-Sep-20	EPA200.8
Beryllium	< 0.1	0.1	µg/L	03-Sep-20	EPA200.8
Bismuth	< 0.2	0.2	µg/L	03-Sep-20	EPA200.8
Boron	48.7	0.9	µg/L	03-Sep-20	EPA200.8
Cadmium	< 0.1	0.1	µg/L	03-Sep-20	EPA200.8
Cesium	< 0.1	0.1	µg/L	03-Sep-20	EPA200.8
Chromium	0.2	0.1	µg/L	03-Sep-20	EPA200.8
Cobalt	0.1	0.1	µg/L	03-Sep-20	EPA200.8
Copper	1.7	0.2	µg/L	03-Sep-20	EPA200.8
Iron	170	5	µg/L	03-Sep-20	EPA200.8
Lead	0.2	0.1	µg/L	03-Sep-20	EPA200.8
Lithium	1.0	0.2	µg/L	03-Sep-20	EPA200.8
Manganese	18.2	0.1	µg/L	03-Sep-20	EPA200.8

ReportDate: Wednesday, September 16, 2020

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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.:
200655

- CERTIFICATE OF ANALYSIS -

Client Sample ID: SW-2

Taiga Sample ID: 006

Mercury	< 0.01	0.01	µg/L	03-Sep-20	EPA200.8
Molybdenum	2.2	0.1	µg/L	03-Sep-20	EPA200.8
Nickel	0.6	0.1	µg/L	03-Sep-20	EPA200.8
Rubidium	1.1	0.1	µg/L	03-Sep-20	EPA200.8
Selenium	< 0.5	0.5	µg/L	03-Sep-20	EPA200.8
Silver	< 0.1	0.1	µg/L	03-Sep-20	EPA200.8
Strontium	178	0.1	µg/L	03-Sep-20	EPA200.8
Thallium	< 0.1	0.1	µg/L	03-Sep-20	EPA200.8
Tin	< 0.1	0.1	µg/L	03-Sep-20	EPA200.8
Titanium	4.5	0.1	µg/L	03-Sep-20	EPA200.8
Uranium	6.4	0.1	µg/L	03-Sep-20	EPA200.8
Vanadium	0.3	0.1	µg/L	03-Sep-20	EPA200.8
Zinc	< 5.0	5	µg/L	03-Sep-20	EPA200.8

ReportDate: Wednesday, September 16, 2020

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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.:
200655

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **SW-2**

Taiga Sample ID: **006**

- DATA QUALIFIERS -

Data Qualifier Descriptions:

222 *Result suspect low, possible minimal sample loss when bottle opened.*

*** 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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**ANNUAL REPORT
FOR THE KUGAARUK LANDFARM**

Appendix B: CIRNAC Inspection Report



WATER LICENCE INSPECTION FORM

☒ Original
☐ Follow-Up Report

Licensee		Licensee Representative	
Government of Nunavut CG&S		Shah Alam	
Licence No. / Expiry		Representative's Title	
1BR-KRK1929		Municipal Engineer	
Land / Other Authorizations		Land / Other Authorizations	
Date of Inspection		Inspector	
2020 August 14		Baba Pedersen	
Activities Inspected			
☐ Camp	☐ Drilling	☐ Mining	☐ Construction
☐ Roads/Hauling	☐ Other:	☒ Other: Land Farm	☐ Reclamation
☐ Fuel Storage			

Conditions:		A - Acceptable	C - Concern	U - Unacceptable	NA – Not Applicable	NI – Not Inspected					
Water Use		Condition	Comment	Site Conditions		Condition	Comment	Haz/Mat Management		Condition	Comment
Intake/Screen				Water Management Structures		A	6	Storage			
Flow Measure. Device				Culverts / Bridges				Spills			
Source:				Drainage				Spill Plan			
Water Use:				Erosion / Sediment							
Recirculation (y /n)				Mitigation Measures		C	7	Administrative			
				Reclamation Activities		A	5	Records			
				Materials Storage		A		Reports		A	8
Waste Disposal				Signage		A	1,2&3	Plans			
Waste Water								Notifications			
Solid Waste				Monitoring				Other			
Hazardous Waste				Sample Collection / Analysis		C	4				
*The number in the comments field will correspond with specific comments provided below.											
Samples taken by Inspector:				Location(s):							
☐ Yes ☒ No											

SECTION 1	☒ Comments (s. __)	☐ Non-Compliance with Act or Licence (s. __)	☐ Action Required (s. __)
On Friday August 14, 2020, I Baba Pedersen, Resource Management and Water Resources Officer with Crown-Indigenous Relations and Northern Affairs Canada, the Writer of this Report, did Inspect the holder (Government of Nunavut – CGS) of Water License Number 1BR-KRK1929 issued for a Land Farm in Kugaaruk, in the Kitikmeot Region of Nunavut.			
I was accompanied by Shah Alam, Municipal Engineer for the GN-CGS.			
SECTION 2	☒ Comments	☐ Non-Compliance with Act or Licence	☐ Action Required
During the August 14 Site Inspection, the following was observed by the Inspector;			
1. Signage at the Entrance to the Facility (Photo 1) 2. Signage to indicate the location of Sample Station SW-1 (Photo 2) 3. Signage to indicate the location of Sample Station SW-2 (Photo 3) 4. The Decant Area of the Lower Level of the Facility (Photo 4) 5. The Soil Remediation Area in the Upper Level of the Facility (Photo 5) 6. The damaged area, from the last Inspection, of the Berm in the Lower Level adjacent to Sample Station SW-2 (Photo 6) 7. Animal Burrow Holes in the Perimeter of the Berm (Photos 7 and 8) 8. Annual Reports have been submitted to the Nunavut Water Board			
SECTION 3	☐ Comments	☐ Non-Compliance with Act or Licence	☒ Action Required
1. Appropriate Signage has been installed at the Facility Entrance as per my request from the last Inspection – Thank you 2. Appropriate Signage has been installed at Sample Station SW-1 as per my request from the last Inspection – Thank you 3. Appropriate Signage has been installed at Sample Station SW-2 as per my request from the last Inspection – Thank you 4. The Lower Cell needs to be Sampled and Decanted PRIOR to Freeze up 5. The Upper Level Soil Contents have been Turned to assist in the Remediation Process – Thank you 6. The Damaged Area of the Lower Berm has been Repaired as per my request from the last Inspection – Thank you 7. All Animals digging holes into the Berm MUST be Permanently Removed BEFORE Freeze-up and ensure that more animals do not return in the future. All Existing Holes dug into the Berm by Animals MUST be Filled In and Covered to prevent further erosion PRIOR to Freeze-up 8. Annual Reports have been Submitted to the Nunavut Water Board as required – Thank you			



Licensee or Representative	Inspector's Name
	Baba Pedersen
Signature	Signature
	Signed Original on File
Date	Date
	2020 November 12

Office Use Only:	Follow-up report to be issued by Inspector	☐ Yes ☒ No
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cc. CIRNAC, Manager Field Operations, Iqaluit, justin.hack@canada.ca

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

PHOTO LOG

Date	Camera	Inspector	Authorization
2020 August 14	Sony DSC-HX50V	Baba Pedersen	1BR-KRK1929
Photo Log # DSC06296			
Photo 1			
			
Description: Signage Installed at Entrance to Facility as requested during last Inspection – Thank You			
Photo Log # DSC06304			
Photo 2			
			
Description: Signage Installed at Sample Station SW-1 as requested during last Inspection – Thank you			



Photo Log # DSC06310

Photo 3



Description: Signage Installed at Sample Station SW-2 as requested during last Inspection – Thank you

Photo Log # DSC06312

Photo 4



Description: Lower Cell needs to be Sampled then Decanted



Photo Log # DSC06298

Photo 5



Description: Hamlet Turned the Soil in the Land Farm on behalf of the GN CGS in the Fall of 2019 to Facilitate Remediation – Thank you

Photo Log # DSC06311

Photo 6



Description: Berm Repair adjacent to Sample Station SW-2 has been completed as requested from last Inspection – Thank you

Photo Log # DSC06315

Photo 7



Description: Animal Burrow Holes found in the Berm Perimeter – View 1

Photo Log # DSC06316

Photo 8



Description: Animal Burrow Holes found in the Berm Perimeter – View 2