ANNUAL REPORT
FOR THE HAMLET OF QIKIQTARJUAQ, 2021

YEAR BEING REPORTED: 2021

The following information is compiled pursuant to the requirements of Part B, Item 1 of Water Licence No. **3BM-QIK1924** issued to the **Hamlet of Qikiqtarjuaq**.

i) - iii) tabular summaries of all data generated under the "Monitoring Program"; monthly and annual quantities in cubic metres of freshwater obtained from all sources; monthly and annual quantities in cubic metres of each and all wastes discharged;

Attached are the quantities of water used as reported in our On Tap Water Delivery System and the estimated discharge of sewage waste.

Month Reported	Quantity of Water Obtained from all sources (m^3)	Quantity of Sewage Waste Discharged (m^3)
January	2,022.4301	Same
February	1,955.7734	Same
March	2,069.5639	Same
April	2,025.2009	Same
May	2,020.5672	Same
June	2,054.5469	Same
July	1,999.9285	Same
August	1,890.1959	Same
September	1,845.3349	Same
October	1,978.8213	Same
November	2,051.0455	Same
December	2,045.5484	Same
ANNUAL TOTAL	23,958.9569	Same

Note: The water consumption volume is considered equal to the sewage discharge volume because there is no meter at the end of the discharge pipe.

IV. A summary of modifications and/or major maintenance work carried out on the Water Supply and Waste Disposal Facilities, including all associated structures and facilities:
- During the reporting period, no modification and/or major maintenance works were carried out on any Water Licensed Facilities.

V. A list of unauthorized discharges and summary of follow-up action taken:
- No unauthorized discharges for the infrastructure under license 3BM-QIK1924 occurred in 2021.

VI. A summary of any abandonment and restoration work completed during the year and an outline of any work anticipated for the next year:
- There was no abandonment and restoration work completed during 2021.

VII. A summary of any studies requested by the Board that relate to waste disposal, water use or reclamation, and a brief description of any future studies planned:
- None.

VIII. Any other details on water use or waste disposal requested by the Board by November 1st of the year being reported; and
- None

IX. updates or revisions to the approved Operation and Maintenance Plans:
- None

ADDITIONAL INFORMATION THAT THE LICENSEE DEEMS USEFUL:
- CGS will work with the Municipality during summer 2022 to ensure all sampling requirements under the water license are met.

FOLLOW-UP REGARDING INSPECTION/COMPLIANCE CONCERNS:
- The licensee will work with CIRNAC during the 2022 Inspection to determine a suitable site or process to relocate or continue Monitoring Program Station QIK-4, QIK-5, QIK-7, QIK-9, QIK-10, and QIK-11.

Appendix A: QIK-6 Effluent Quality Limits

Appendix B: Certificate of Analysis September 10, 2021

Appendix C: Hazardous Materials Spill Database, Qikiqtarjuaq 2021

Appendix D: Qikiqtarjuaq 2021 CIRNAC Inspection Report

Appendix A

3BM-QIK1924 Qikiqtarjuaq Monitoring Program Results 2021

QIK-6 Effluent Quality limits

Parameter	Maximum Concentration of any Grab Sample	Sampling Results QIK-3 10-Sept-21	Sampling Results QIK-7 10-Sept-21
BOD_5	120 mg/L		
Total Suspended Solids	180 mg/L	64 mg/L	68 mg/L
Fecal Coliform	$1x10^4$ CFU/100 mL	95,000 CFU/100 mL	88,000 CFU/100 mL
Oil and Grease	No visible sheen	12.4 mg/L	11.2mg/L
pH	Between 6 and 9	7.32	7.29

No QIK-6 Effluent Quality Limit values were received by CGS, please see QIK-3 and QIK-7 results above for comparison.

Appendix B

CADUCEON™ ENVIRONMENTAL LABORATORIES
Client committed. Quality assured.

CERTIFICATE OF ANALYSIS

Preliminary Report

C.O.C.: G096040 **REPORT No. B21-29156**

Report To:

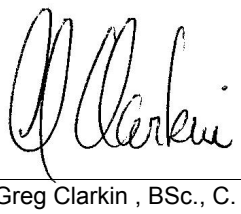
Municipality of Qikiqtarjuaq
P.O. Box 4,
Qikiqtarjuaq Nunavut
Attention: Samuel Nuqingaq

Caduceon Environmental Laboratories
2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 13-Sep-21
DATE REPORTED: 17-Sep-21
SAMPLE MATRIX: Waste Water

JOB/PROJECT NO.:
P.O. NUMBER:
WATERWORKS NO.

			Client I.D.		Waste Water #3	Waste Water #7		
			Sample I.D.		B21-29156-1	B21-29156-2		
			Date Collected		10-Sep-21	10-Sep-21		
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Hardness (as CaCO3)	mg/L	1	SM 3120	14-Sep-21/O	14	14		
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	13-Sep-21/O	150	146		
pH @25°C	pH Units		SM 4500H	13-Sep-21/O	7.32	7.29		
Conductivity @25°C	µmho/cm	1	SM 2510B	13-Sep-21/O	423	424		
Total Suspended Solids	mg/L	3	SM2540D	14-Sep-21/K	64	68		
Chloride	mg/L	0.5	SM4110C	13-Sep-21/O	26.4	26.1		
Nitrite (N)	mg/L	0.1	SM4110C	13-Sep-21/O	< 0.1	< 0.1		
Nitrate (N)	mg/L	0.1	SM4110C	13-Sep-21/O	< 0.1	< 0.1		
Sulphate	mg/L	1	SM4110C	13-Sep-21/O	< 1	< 1		
Aluminum	mg/L	0.01	SM 3120	14-Sep-21/O	0.19	0.20		
Arsenic	mg/L	0.0005	EPA 200.8	16-Sep-21/O	< 0.0005	0.0005		
Cadmium	mg/L	0.005	SM 3120	14-Sep-21/O	< 0.005	< 0.005		
Calcium	mg/L	0.02	SM 3120	14-Sep-21/O	2.88	3.05		
Chromium	mg/L	0.002	SM 3120	14-Sep-21/O	< 0.002	< 0.002		
Cobalt	mg/L	0.005	SM 3120	14-Sep-21/O	< 0.005	< 0.005		
Copper	mg/L	0.002	SM 3120	14-Sep-21/O	0.091	0.094		
Iron	mg/L	0.005	SM 3120	14-Sep-21/O	0.716	0.752		
Lead	mg/L	0.02	SM 3120	14-Sep-21/O	< 0.02	< 0.02		
Magnesium	mg/L	0.02	SM 3120	14-Sep-21/O	1.54	1.67		
Manganese	mg/L	0.001	SM 3120	14-Sep-21/O	0.024	0.026		
Mercury	mg/L	0.00002	SM 3112 B	14-Sep-21/O	0.00003	0.00003		
Nickel	mg/L	0.01	SM 3120	14-Sep-21/O	< 0.01	< 0.01		
Sodium	mg/L	0.2	SM 3120	14-Sep-21/O	21.2	22.8		
Zinc	mg/L	0.005	SM 3120	14-Sep-21/O	0.071	0.072		
Ammonia (N)-Total	mg/L	0.01	SM4500-NH3-H	15-Sep-21/K	41.4	43.5		
Phenolics	mg/L	0.002	MOEE 3179	15-Sep-21/K	0.274	0.270		



Greg Clarkin , BSc., C. Chem
Lab Manager - Ottawa District

R.L. = Reporting Limit
Test methods may be modified from specified reference method unless indicated by an *
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

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Preliminary Report

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JOB/PROJECT NO.:
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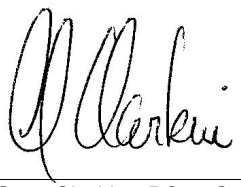
WATERWORKS NO.

			Client I.D.		Waste Water #3	Waste Water #7		
			Sample I.D.		B21-29156-1	B21-29156-2		
			Date Collected		10-Sep-21	10-Sep-21		
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
BOD(5 day)	mg/L		SM 5210B	/				
Total Organic Carbon	mg/L	0.2	EPA 415.2	13-Sep-21/O	43.5	37.0		
Oil & Grease-Total	mg/L	1.0	SM 5520	16-Sep-21/K	12.4	11.2		
Fecal Coliform	cfu/100mL	1	MOE E3371	13-Sep-21/O	95000	88000		



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Appendix C

No spills were reported to the NT-NY Spill Report Line and are listed on the Hazardous Materials Spill Database for Qikiqtarjuaq in 2021

Appendix D

WATER LICENCE INSPECTION FORM

☒ Original
☐ Follow-Up Report

Licensee	Licensee Representative
Hamlet of Qikiqtarjuaq	Bhabesh Roy
Licence No. / Expiry	**Representative's Title**
3BM-QIK1924 exp. September 19, 2024	Regional Engineer
Land / Other Authorizations	**Land / Other Authorizations**
Date of Inspection	**Inspector**
October 12 ,2021	Joseph Monteith

Activities Inspected

☐ Camp ☐ Drilling ☐ Mining ☐ Construction ☐ Reclamation ☐ Fuel Storage

☐ Roads/Hauling ☒ Other: Potable Water Source, Waste Water Treatment Facility, Solid Waste Facility ☐ Other:

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

PART:	Condition	Observation No.*
A: SCOPE, DEFINITIONS AND ENFORCEMENT	A	
B: GENERAL CONDITIONS	A	
C: CONDITIONS APPLYING TO SECURITY	NI	
D: CONDITIONS APPLYING TO WATER USE	A	1-4
E: CONDITIONS APPLYING TO WASTE DISPOSAL AND MANAGEMENT	C	5-15
F: CONDITIONS APPLYING TO MODIFICATIONS	NI	
G: CONDITIONS APPLYING TO CONSTRUCTION	NI	
H: CONDITIONS APPLYING TO EMERGENCY RESPONSE AND CONTINGENCY PLANNING	A	16
I: CONDITIONS APPLYING TO ABANDONMENT, RECLAMATION AND CLOSURE PLANNING	NA	
J: CONDITIONS APPLYING TO MONITORING	A	
SCHEDULES	A	

**The observation number corresponds with specific comments provided below.*

Samples taken by Inspector:	Location(s): Latitude: 67° 33' 00'' N and Longitude: 64°02' 00'' W location is incorrect using datum: WGS 84
☐ Yes ☒ No	

SECTION 1 ☒ **Comments** (s.__) ☐ **Non-Compliance with Act or Licence** (s.__) ☐ **Action Required** (s.__)

BACKGROUND

On August 2, 2019, The Nunavut Water Board emailed the proponent, and WRO Monteith acknowledging receipt of a Water Licence Renewal application. On September 20, 2019, The Nunavut Water Board approved the Hamlet a renewal licence 3BM-QIK1924 effective on September 20, 2019, and expires on September 19, 2024. The licence renewal authorizes the Hamlet to withdrawal 34,500m³ per annum or maximum of 299 m³ per day.

Community infrastructure includes:
- A Water Supply Facilities which draws water from Tulugak River. Water is transferred by gravity from the intake location to the Water Storage Reservoir, and is treated in the truck-fill station and is delivered by trucks to holding tanks in each building;
- A Sewage Disposal/Treatment Facilities (double celled lagoon system) which receives trucked sewage collected from holding tanks in each building and houses, with a wetland area between the lagoon and the ocean; and
- A Solid Waste Facility, which includes a Metals disposal area, and Hazardous Waste storage area. Segregation of waste needs to be approved.

Inspector Statement

On October 12, 2021**,** A water licence inspection was conducted by Water Resource Officer Joseph Monteith at the Hamlet of Qikiqtarjuaq, Qikiqtani Region,

General Condition

On July 29, 2021, Richard Dwyer, Nunavut Water Board – Manager of Licencing, emailed WRO Monteith a copy of Qikiqtarjuaq's 2020 Annual Report, satisfying Part B: Subsection 1 of the general condition of the water licence.

Water Use and Related Structures

1. Water is being withdrawn from Tulugak River (Photo 1). The water is transferred by gravity to the intake location, which settles approximately 4-6 inches above the intake pipe. The activity of filling up the Water reservoir requires filling the pipe (Photo #2) which recharges the reservoir as described above (See Photo #3) using underground pipe made out of HDPE approximately 8 inches in diameter transfers the water to the water reservoir, then into the treatment facility (See Photo #4). After filling up the reservoir the water is then transferred to the truck fill station and treated with liquid Chlorine, and filtered before being pumped into trucks for delivery (see Photo #5).
2. An operating water flow meter was observed on site, and read Gallons (Photo 6).
3. A log sheet for truck fill procedures undated showed a weekly total of 821800 Gallons was withdrawn at the time of the inspection (see Photo 7).
4. The water reservoir didn't appear to be working as intended as there is a suspected leak in the liner of the reservoir. The outer walls appeared to be slumping and leaking water from the reservoir on the North wall of the reservoir (Photo 8). Samuel Nuqingaq, Municipal Forman for Hamlet of Qikiqtarjuaq said that once the reservoir hits 22 metres full(measured diagonally from the top of the water table to the bottom of the lagoon on the opposite side of the water table measurement), the leak of the water reservoir begins. At the time of the inspection the recharge pipe was closed, and the water level below the recharge pipe (See photo 3).

Waste Water Treatment Facility

5. The waste water treatment facility lagoon walls continue to appear to have a sign of a leak in the south east side of the lagoon (see Photo 9).
6. The freeboard was below the 1 metre mark in most parts of the lagoon (See Photo 10).
7. Windblown garbage was observed in the Waste Water Treatment Facility (See Photo 10).
8. The decanting pipe protruding up above the waste water table. With freeboard height, this pipe doesn't appear to be operating as intended (See Photo 10).

Solid Waste Facility

9. The licensee manages their solid waste by segregating the hazardous waste, burning and capping, and stocking bulk metals and woods separately. The licensee manages water by building dykes to limit the amount of water flowing in and out of the facility.
10. The Solid Waste Facility has good signage indicating where the metals dump, and land farm.
11. The hazardous Waste is within the fenced part of the burn and cap section of the Solid Waste Facility. Although there is sea can for the public to deposit waste in, it is full of batteries, paints, waste oil containers. Some signs of hazardous waste was observed in the burn and cap. Another sea can to deposit more hazardous waste was requested by Bhabesh Roy, P,Eng., Regional Engineer.
12. The fencing around the burn and cap facility requires maintenance on the East wall and repair on the North wall (see photo 15).

Hazardous Materials and Waste/Soil Treatment Facility

13. Further to the Solid Waste Facility is a mix of historic metals waste home heating fuel tanks, white waste such as washers, dryers, fridges, freezers, and hazardous waste as oil drums, and propane tanks in bermed and no berm sections on the south side. Some of the bermed sections have lining, but are improperly installed or unmaintained (See Photo #16).
14. Hazardous Waste was observed throughout the Solid Waste Facility (see photos 15) .
15. A soil treatment facility lays uncommission. It was observed that the incomplete soil remediation project contained water (See photo #13), and must be discharged appropriately as per the water licence discharge requirements. The plan to complete the soil treatment facility was authorized to be completed. At the time of the inspection, it was noted that the consulting engineer of the facility had visited the site, but did not say it was completed.

Spill Report 2019

16. A leak from a pallet of waste oil drums was observed. There was potential for the spill to migrate to a drainage basin where there was moving water present. The hazardous waste stored there is within a couple of metres of the water course.

SECTION 2	☐ **Comments**	☒ **Non-Compliance with Act or Licence**	☐ **Action Required**

-Part B: Item 7
The Licensee shall immediately report to the 24-Hour Spill Report Line at (867) 920-8130, any spills of Waste, which are reported to, or observed by the Licensee, within the municipal boundaries or in the areas of the Water Supply or Waste Disposal Facilities.

-Part D: Item 10
The Licensee shall segregate and store all hazardous waste material and/or hazardous waste within the Solid Waste Facility in a manner as to prevent the deposit of deleterious substances into any water until such a time as proper disposal arrangements are made;

-Part D: Item 11
The Licensee shall implement measures to prevent hazardous materials and/or leachate from the Solid Waste Disposal Facility from entering water.

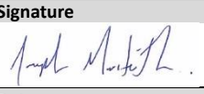
As such, to ensure the terms and conditions of your water license are met, your attention in this matter is required.

SECTION 3 ☐ **Comments** ☐ **Non-Compliance with Act or Licence** ☒ **Action Required**

The following information is a summary of the Actions Required by the licensee to promote and ensure compliance. Please provide a response to the following Actions Required within 30 days of receiving this report proposing timelines to address the concerns noted.

- Provide an update for the completion of the Soil Remediation Structure.
- Verify that damage was done to the Waste Water Treatment Facility walls.
- Verify that damage was done to the Water Treatment Facility Reservoir walls.
- Purchase the proper cap for the Water Treatment Facility Water Reservoir Recharge Pipe, to stop the leak of water into the reservoir.
- Seek consultation with the inspector for a suitable site or process to re-locate or continue Monitoring Program Station for QIK-4, QIK-5,QIK-7,QIK- 9,QIK- 10, and QIK- 11.
- Consolidate all hazardous waste in the burn and cap, and bulk metals facilities and segregate
- The Licensee is reminded to remain diligent to prevent wastes from entering water, the environment, and adhere to the discharge requirements for waste disposal detailed in the water licence.

As such, to ensure the terms and conditions of your water license are met, your attention in this matter is required.

Licensee or Representative	**Inspector's Name**
Bhabesh Roy	Joseph Monteith
Signature	**Signature**
	
Date	**Date**
	November 3 , 2021

CC: Licensing Department, NWB
Justin Hack, Manager of Field Operations, CIRNAC

Photo Log

Date	Camera	Inspector	
October 12, 2021	Nikon Coolpix	Joseph Monteith	

Photo Log #1	Location
Photo 1	Qikiqtarjuaq

Description: Tulugak River: Water Withdrawal location. Ice froze the top portion of the ditch.

Photo Log #1	Location
Photo 2	Qikiqtarjuaq

Description: water intake pipe. More than 50% below the water table.

Photo Log #1	Location
Photo 3	Qikiqtarjuaq

Description: Water Reservoir – intake pipe from water withdrawal location at Tulugak River. Uncontrolled withdrawal of water from the water source

Photo Log #	Location
Photo 4	Qikiqtarjuaq

Description: Water Treatment Facility/Truck Pumping House. Samuel Nuqingaq

Photo Log #	Location
Photo 5	Qikiqtarjuaq

Description: Inside Water Treatment Plant. Mobile Water Pump with mesh screen behind auger drill.

Photo Log #1	Location

Photo 6	Qikiqtarjuaq

Description: Water Meter reads 821800 Gallons x 100

Photo Log #1	**Location**
Photo 7	Qikiqtarjuaq

Nunavut

Name of the Community Water System: Qikiqtarjuaq
Week of: October 11, To: October 16, 2021
Operator: Bobby Angnatok

Water Truck #		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Time		4:55pm	11:30am					
Flow Meter (Litre)	First Reading	29763862	29798968					
	Second Reading	29798968						
Flow Rate of Water Pump		304.5	296.0					
Chlorine Tank Level		30	28					
Chlorine Pump Stroke Setting		40	40					
Free Chlorine (mg/L) Between 0.2 and 0.5		0.30	0.27					
Total Chlorine (mg/L) Greater than Free Chlorine		0.39	0.36					
Turbidity (NTU) wus2 wh3i z	Raw Water	0.45	0.81					
	Treated Water	0.70	0.68					
Building Temperature (°C)	Pump Room	18.6°	19.7°					
	Generator Room	22.6°	23.2°					
Heat Trace Power On (Y or N)	Pump Room	NO	NO					
	Truck Fill	NO	NO					
Operators Initials		B.A	B.A.					

Please email to Bhabesh Roy at broy@gov.nu.ca, Jason Mablick at jmablick@gov.nu.ca and William Koonoo at wkoonoo@gov.nu.ca

Comments: (Identify and make note of any problem)

Description: 3. A log sheet for truck fill procedures not dated. a total of 15656930 Litres withdrawn to date. This appears to run contrast to whats been observed in the water meter.

Photo Log #1	**Location**
Photo 8	Qikiqtarjuaq

Description: signs of slumping on outer wall of Water Reservoir. Once the reservoir reaches 22 metre(measured diagonally) the reservoir leaks

Photo Log #1	Location
Photo 9	Qikiqtarjuaq

Description: Some signs of sewage seeping out of the South side outer wall of Waste Water Treatment Facility.

Photo Log #1	Location
Photo 10	Qikiqtarjuaq

Description: Fence requires repair on the North East side of burn and cap facility

Photo Log #1	Location
Photo 11	Qikiqtarjuaq

Description: Damaged fencing on North Side of Wall of burn and cap facility

Photo Log #1	Location

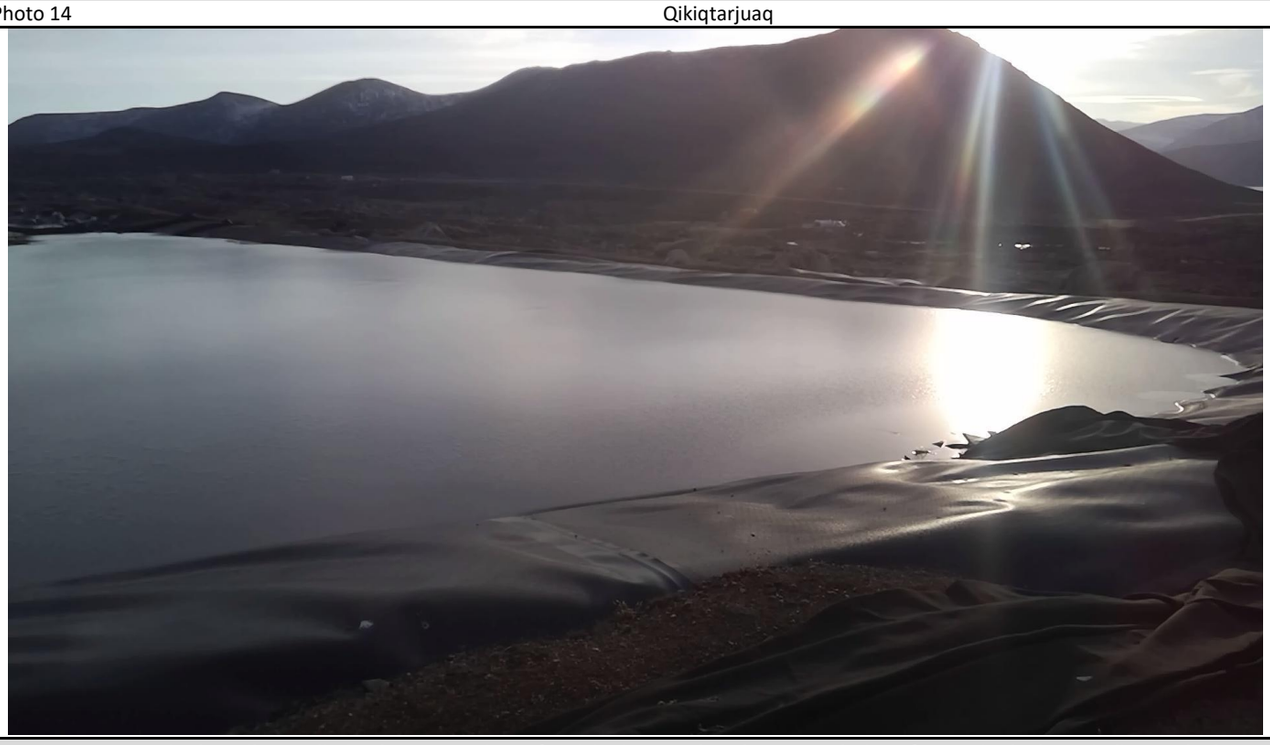
Photo 12	Qikiqtarjuaq

Description: Signs of windblown garbage in Waste Water Treatment Facility – Decanting Pipe appears above the lagoon waste water table. Freeboard appears to be above the 1 metre freeboard. Some free blown garbage observed in the lagoon.

Photo Log #1	**Location**
Photo 13	Qikiqtarjuaq

Description: Below the lined, and unlined berms and mixed metals. Water exiting the bulk metals. Observed 2019, this area seems to be the natural drainage route of water.

Photo Log #1	Location
Photo 14	Qikiqtarjuaq



Description: Water in the soil remediation berm. No signs of activity in 2021, but the accumulation of water in the berm indicates the berm isn't damaged.

Photo Log #1	Location
Photo 15	Qikiqtarjuaq

Description: Hazardous waste in the bulk metals section of the solid waste facility. Batteries, paint cans, and propane tanks.

Photo Log #1	Location
Photo 15	Qikiqtarjuaq

Description: Back section of the Hazardous Waste Facility. Multiple berms for storage of hazardous waste.