Environment and Climate Change Canada | Environnement et Changement climatique Canada

Water Licence 8BC- EUR2131

2023 Annual Report

Eureka High Arctic Weather Station

1871 | 2021
1971 | 2021

Canada

Table of Contents

List of Figures

List of Tables

Appendices

1. Introduction

The Eureka High Arctic Weather Station (HAWS; the Project; the Site) is located on the north side of Slidre Fjord, at the northwestern tip of Fosheim Peninsula, Ellesmere Island, Nunavut (**Figure 1**). Since 1947, Department of Environment (ECCC) has owned and managed the overall operations and maintenance of the Site under Land Reserve #1021. The total area of the Site is approximately 2.23 hectares. There are presently 15 primary buildings and other facilities at the HAWS. The Eureka runway is located 1.5 kilometres northeast of the HAWS main complex and is the primary way by which the HAWS is accessed year-round.

The Eureka HAWS is an operational weather monitoring facility as well as a hub of activity for the Department of National Defence (DND), the Polar Continental Shelf Project, and the Polar Environment Atmospheric Research Laboratory (PEARL). Additional sites at Eureka are operated by the Canadian Network for the Detection of Atmospheric Change including the PEARL and the Surface and Atmospheric Flux, Irradiance and Radiation Extension and Zero Altitude PEARL Auxiliary Laboratory (Arcadis 2018).

1.1 Purpose of this Document

The purpose of the Water License 8BC-EUR2131 Annual Report is to provide a yearly reference and summary of all works related to the License completed for the Project in 2023. The Standard NWB Reporting Form is included in **Appendix A**. Per the terms and conditions outlined in the Type 'B' Water Licence 8BC-EUR2131, this document provides the following:

- A technical summary of activities of the Project undertaken for the respective year (**Section 2**);
- A work plan for the following year (**Section 3**);
- An annual summary of activities related to water use and the deposit of waste on Site including tables and figures that show the locations of where permitted activities were undertaken (**Section 4 and 5**);
- Water quality monitoring results (**Section 6**);
- Water Licence Inspection (**Section 7**);
- Revisions to applicable Management Plans (**Section 8**);
- Progressive reclamation work undertaken (**Section 9**); and,
- Public consultation undertaken (**Section 10)**.

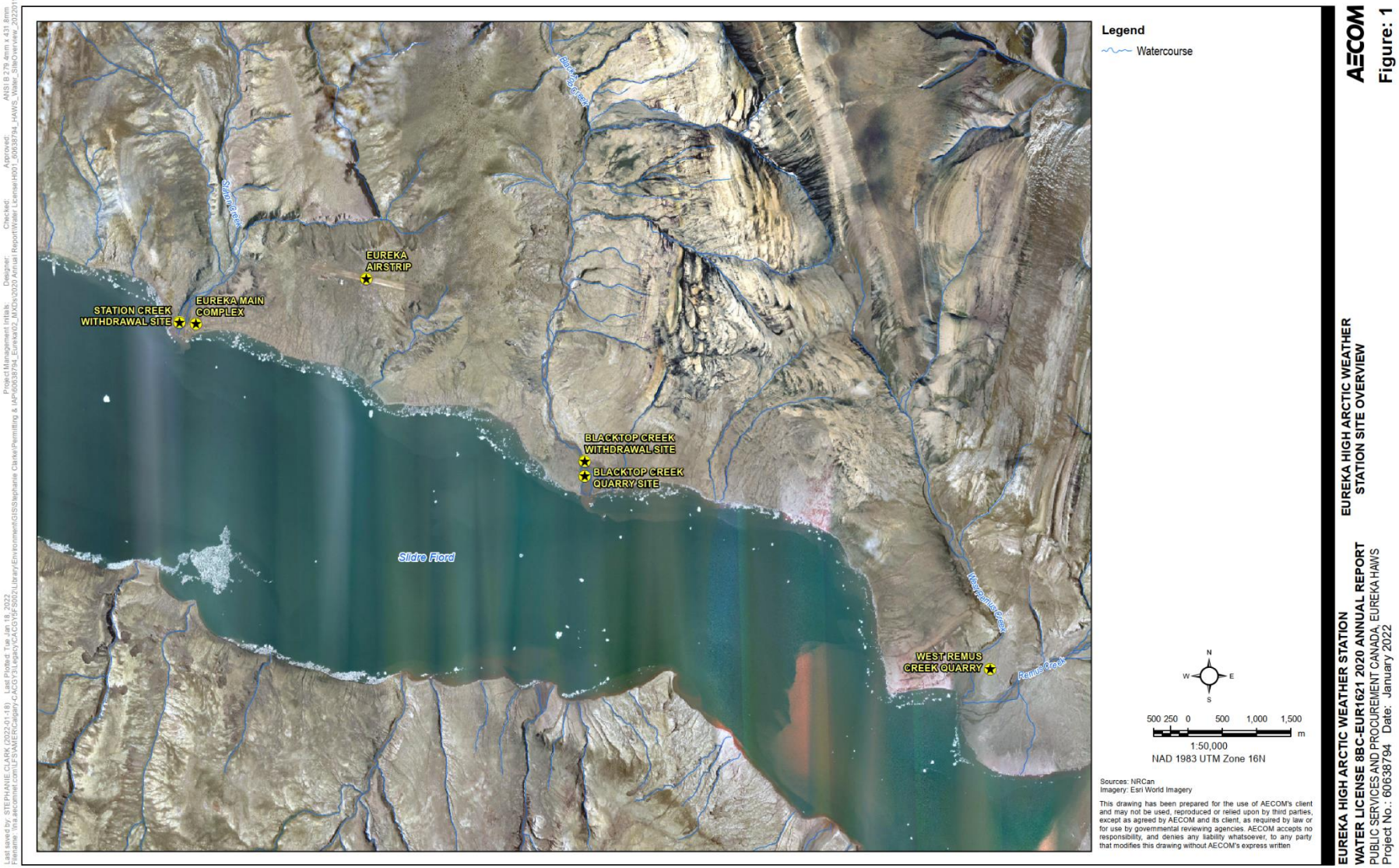
1.2 Project Overview

ECCC is currently undertaking or planning a number of construction and infrastructure upgrade projects to the Eureka HAWS. To support these projects, ECCC has obtained a number of permits. Due to project updates, design changes, unforeseen issues such as the discovery of contaminated soils or the need for additional infrastructure to support the HAWS operation or projects, ECCC may be required to re-apply for new or amended licences and permits. The numerous improvement projects currently being undertaken or planned for include the following:

- Eureka Water and Wastewater Treatment Infrastructure Upgrades Project
- Fuel Tank Inspections
- Construction and Operation of a Soil Treatment Facility(Landfarm Facility)
- Water Quality Monitoring Program
- Black Top and West Remus Quarry
- Program of Works including Building Demolition and Renovations

- Runway Maintenance and Minor Upgrade

Figure 1: Eureka High Arctic Weather Station Site Overview



2. Technical Summary of Activities Undertaken in 2023

The Eureka HAWS maintained operational activities throughout the year at the Eureka Main Complex. A technical summary of all activities undertaken in 2023 is listed below.

- The construction camp was opened and fleet maintenance commenced on June 1, 2023.
- The construction crew started to increase in size from June 8, 2023.
- All necessary equipment maintenance and repairs were completed in readiness for the construction season.
- The construction activities encompassed:
    - Upgrading and maintaining the access road between the airstrip and the HAWS operations building.
    - Conducting maintenance and repairs on the access road to West Remus Quarry, which included grading, culvert maintenance, and freshet observations at the Blacktop Creek bridge.
    - Resuming quarrying and crushing at West Remus Creek quarry throughout July and August. In 2023, under the authority of quarry permit 2022QP0002, a total volume of 55,818 cubic meters of aggregate was extracted from the West Remus Creek Quarry. This extraction increased the cumulative volume of quarried material at West Remus Creek to 369,757 cubic meters, leaving 130,043 cubic meters available for future extraction. No quarrying activities were conducted at either the Blacktop Quarry or the West of Eureka HAWS, which are governed by permits 2022QP0003 and 2020QP0002, respectively.
    - Transporting crushed granular materials from Blacktop quarry and West Remus quarry to the new water reservoir.
    - Installing three out of four layers of liner in the new water reservoir.
    - Completing the earthworks construction of new water reservoir berms (See **Figure 2**).
    - Initiating the construction of a pad, a new Creek Pumphouse, and Transfer Pumphouse near Station Creek.
    - Dismantling and removing five buildings around the main complex and preparation for dismantling and removing five others.
    - Received and stored sealift freight for future project work.
- Fuel resupply was achieved through air delivery, with both Summit Air and Calm Air providing bulk fuel delivery via ATR72 cargo aircraft equipped with a Transport Canada certified bladder system.
- Waste disposal and storage activities completed in 2023 include:
    - Accumulating waste oil generated through equipment servicing activities into double-walled steel containers. Three containers, with an estimated total volume of approximately 12,000 litres of waste oil product, were removed from the Site on the sealift in September 2023.
    - Managed camp waste as follows:
        - Pacto toilets were used throughout the Nuna camp and remote wash car facilities to collect all black water waste, which was then incinerated.
        - The majority of grey water waste from the Nuna camp and remote wash car facilities was collected via a hydrovac truck and deposited in the HAWS wastewater lagoon for treatment before discharge. The total quantity of grey water camp waste was 397,000 litres, based on a truck count of 46 loads at 80% capacity of the rated 10,800-litre tank.
        - The local septic field, constructed at the Nuna camp in 2022 for the disposal of camp grey water, was operational for part of the summer.

        - All combustible waste, such as from camp operations, was collected and incinerated on-Site.
        - Non-hazardous, non-combustible waste generated in the camp, or through construction and maintenance activities, was deposited in the on-Site landfill.
    - 1586 m3 of contaminated soil was excavated from the footprint of the new raw water reservoir and moved to the temporary contaminated soil storage cell area.
- Contaminated soils from a fuel spill in August 2023 were placed into barrels and will be removed from Site to be disposed of at an appropriate facility after the 2024 thaw period and once all contaminated materials are confirmed to have been removed.
- The fleet and camp were winterized for the final departure of the crew on September 14, 2023.

Figure 2 -Photograph of New Freshwater Reservoir

3. Work Plan for 2024

The construction program summary presented below outlines activities planned for 2024 summer field season (June – September):

- The Site will continue to operate as usual, with routine facility maintenance and runway operations. Minor upgrades to the runway include installation of lighting and swale construction for management of runoff.
- The Program of Works Project will involve renovation and retrofit activities throughout the buildings on Site. Older buildings may be demolished and disposed of appropriately.
- The West Remus Creek Quarry operations will continue quarrying activities and crushing to provide aggregate material for other projects.
- The Black Top Creek Quarry operations will commence quarrying activities to provide aggregate material for other projects.
- Progressive reclamation of depleted quarry areas
- Fuel Storage Tank Inspections will continue, involving manual inspections and minor repairs of fuel storage tanks.
- The Contaminated Soil and Landfarm Project will involve the construction of a new Soil Treatment Facility (i.e., Landfarm Facility) and the relocation of contaminated soil from the existing landfarm and old tank farm areas to the new landfarm for treatment.
- Water & Sewer Infrastructure Upgrades will include:
    - Completion of liner system installation and granular cover materials for the raw water reservoir.
    - Filling of the raw water reservoir utilizing approximately 20,000 cubic metres of water from Station Creek
    - Installation of piping systems for water withdrawal from the raw water reservoir.
    - Complete installation of a foundation pad and raw water supply pumphouse building, including electrical connections.
    - Installation of the modular waste water treatment plant , completion of all connections, and start-up and commissioning of the plant.
    - Continued installation of piping, electrical, and pumping systems related to the raw water reservoir and waste water treatment plant.
    - Desludging and repurposing of the existing sewage lagoon into a new retention basin for treated wastewater.
- The camp will be winterized, and personnel will depart in late September 2024
- Ongoing equipment maintenance will generate more waste oil products. These materials are collected and stored in double-walled steel tanks for future removal from the site.

4. Water Use

4.1 Location and Methods

The Eureka HAWS obtains its water for domestic purposes from the Eureka HAWS raw water reservoir pumphouse (**Figure 2**). The reservoir water is pumped from Station Creek using a Franklin Electric FLS-400 pump. Pumping occurs shortly after water starts flowing in Station Creek to maximize the amount of fresh runoff into the Eureka Water Reservoir. Station Creek eventually stops flowing until a second flow begins when the permafrost melts. At this time water is pumped again to ensure the Eureka Water Reservoir is full prior to freeze up. Water for construction purposes and dust suppression is withdrawn from Station Creek, Blacktop Creek, and West Remus Creek when necessary.

Location, quantities, and timeframe of withdrawal are presented in **Table 1**.

Table 1: Water Use Locations and Quantities at Eureka High Arctic Weather Station

Source Description	Quantities (m^3)	Timeframe	Latitude			Longitude		
			Deg (º)	Min (´)	Sec (˝)	Deg (º)	Min (´)	Sec (˝)
For Potable Water								
Eureka Water Reservoir (camp potable water)	502.74	2023	79	59	20	85	56	46
Station Creek Withdrawal Site (Fresh water pumped into the Eureka Water Reservoir)	3881.57	June 28 – August 30	79	59	21	85	57	4
For Construction Use								
Station Creek Withdrawal Site	518.4	June – September	79	59	21	85	57	4
Blacktop Creek Withdrawal Site	1544,4*	June – September	79	58	12	85	38	59
West Remus Creek Withdrawal Site	0	June – September	79	58	23	85	39	43

*The volume reported is for Blacktop Creek and West Remus Creek combined. This was an error in recording data. ECCC will ensure quantities are reported separately for each water course in future years.

4.2 Erosion and Sedimentation/Dust Control

Dust control near the airstrip and haul roads was accomplished using water primarily from Blacktop Creek. A Hydrovac truck was used to take water from the creek and then spray on dry, dusty areas as required. No erosion control was required at the collection site.

Silt fence for erosion control was installed adjacent to the new Creek Pumphouse pad to protect Station Creek along the road or worksites. Conditions are monitored and additional silt fencing is available for use as needed.

5. Waste Disposal

5.1 Location and Methods

All waste disposal activities are conducted in accordance with the *Summary of Operations and Maintenance Procedures for Drinking Water, Sewage, Solid Waste Disposal and Waste Treatment Facilities* (ECCC, June 2022) and approved by the Nunavut Water Board.

Blackwater and greywater from the Station at the Eureka HAWS is deposited in the Sewage Lagoon. Black water from the contractor camp is collected with Pacto toilets and is then incinerated on site; whereas, greywater is pumped or collected via Hydrovac truck and deposited in the Sewage Lagoon (**Figure 2**). A greywater exfiltration trench system is utilized for the treatment of greywater. Ongoing use of the trench is planned for the summer of 2024 and 2025 and until the Wastewater Treatment Plant is commissioned.

The contents of the Sewage Lagoon are decanted into the Slidre Fiord using a Monarch Pump Model TT30 Type E. The Sewage Lagoon is usually decanted once in summer and again prior to freeze-up in August. Prior to decanting, two sets of water samples are taken, and the timing of collection coincides with the produce delivery to ensure the samples arrive at a laboratory within 24 hours. Once the laboratory results are returned, they are assessed for conformity against the Water licence and ECCC requests authorization from CIRNAC to decant. Following approval from CIRNAC, the Sewage Lagoon is decanted until empty or until a layer of ice is uncovered.

Contaminated soil excavated from the new reservoir footprint and from the runway area was placed in the temporary contaminated soil storage area until the new landfarm is constructed and operational (likely 2024 or 2025).

All hazardous waste is transported off-site for disposal at a licenced hazardous waste disposal facility, all non-hazardous combustible waste is incinerated, and solid waste, including ash, is disposed of at the Landfill.

On August 27, 2023, a fuel spill occurred while performing annual fuel resupply by the Canadian Coast Guard ship. Details of the incident can be found in **Section 5.2**.

Table 2 provides locations of waste storage and disposal sites at Eureka HAWS (**Figures 2 and 3)** which include:

- Fuel Tank Farm - Waste fuel and oil products are stored in barrels and transported/disposed of as hazardous waste.
- Construction Contractor Fuel Storage
- Asbestos Waste Facility - In previous years, asbestos was discovered and transported to the Asbestos Waste Facility for storage.
- Drum Crushing Site - Empty barrels are crushed in a lined area and transported off-site for disposal.
- Landfill (Non-Hazardous Solid Waste Disposal Facility) - Miscellaneous waste that cannot be incinerated, including ash from incinerator, is delivered to the Eureka HAWS Non-Hazardous Solid Waste Facility.
- Sewage Lagoon- holds greywater and blackwater prior to decanting into fjord.
- Existing / in-situ landfarm and new Soil Treatment Facility (Landfarm Facility) to be constructed in 2024, and operational likely in 2025. - Existing/ In-situ landfarm currently contains contaminated soils which will be treated in the new landfarm once constructed.

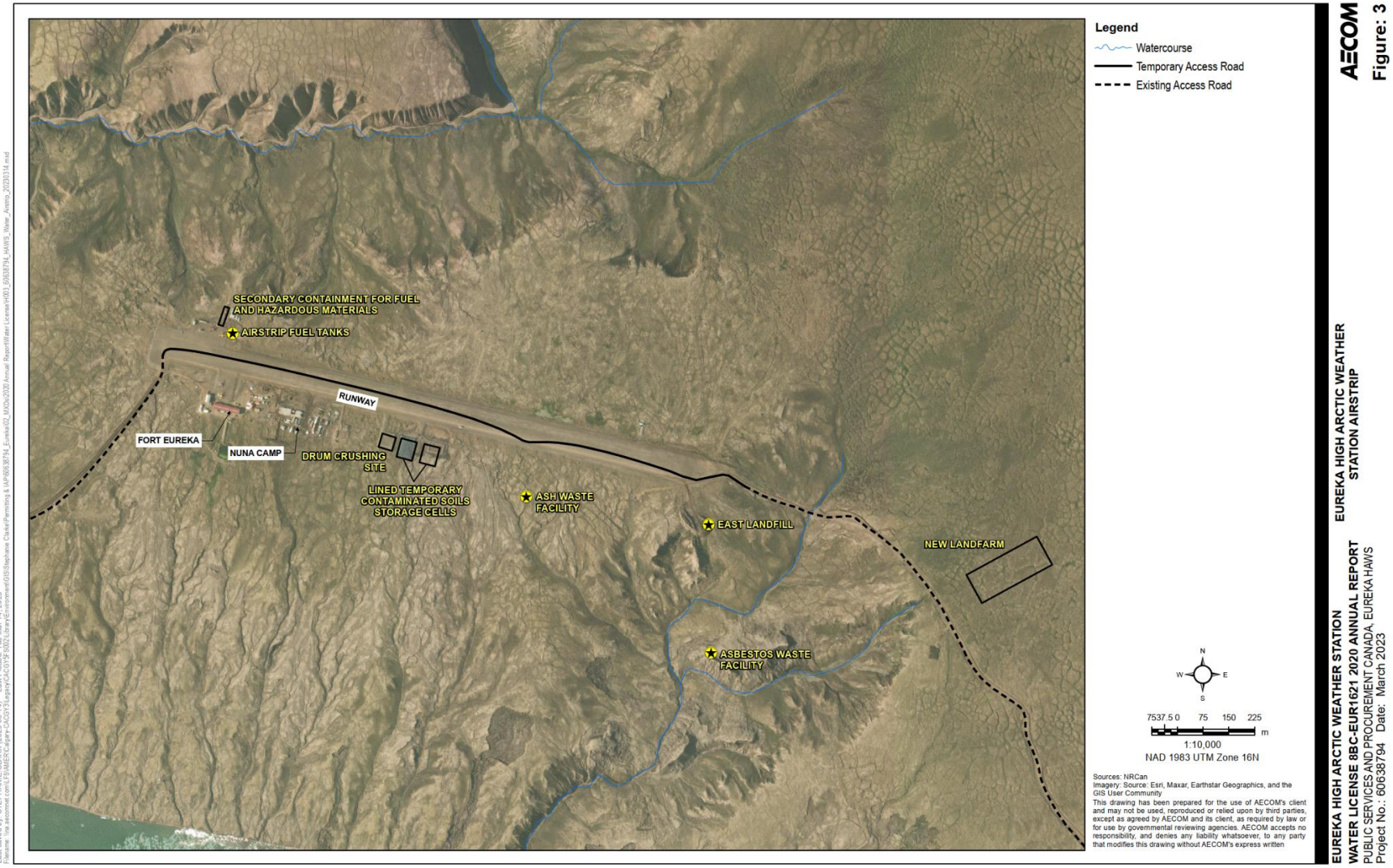
- Temporary Contaminated Soils Storage Cells- these store soils from the main apron area of the airport, as well as an area for contaminated soils prior to the construction and operation of the new landfarm
- Greywater exfiltration trench - used for treating and disposing greywater.

Table 2: Locations for Waste Storage & Disposal Sites at Eureka High Arctic Weather Station

Source Description	Latitude			Longitude		
	Deg (º)	Min (´)	Sec (˝)	Deg (º)	Min (´)	Sec (˝)
Fuel Tank Farm	79	59	24	85	56	10
Construction Contractor Fuel Storage	79	59	38	85	49	27
Asbestos Waste Facility	79	59	17	85	46	10
Drum Crushing Site	79	59	36	85	49	6
Non-hazardous Solid Waste Facility	79	59	29	85	46	14
Sewage Lagoon	79	59	23	85	50	11
New Landfarm	79	59	25	85	43	42
Temporary Contaminated Soil Storage- Adjacent to Runway	79	59	37	85	48	51
Temporary Contaminated Soil Storage – Near Airstrip Fuel Tanks	79	59	50	85	50	26
In situ / Existing Landfarm	79	59	47	85	50	40
Incinerator	79	59	22	85	56	21

Figure 3: Waste and Storage Facilities on the Main Complex of the Eureka High Arctic Weather Station

Figure 4: Waste Disposal Facilities for the Eureka High Arctic Weather Station



5.2 Unauthorized Discharges

There were no unauthorized discharges of water in 2023.

A fuel spill occurred during fuel resupply by the Canadian Coast Guard ship on August 27, 2023, monitored by ECCC. While attempting to purge the remaining fuel from the pipeline to complete the operation, a miscalculation of the remaining space inside the last fuel tank (storage tank system EC-00001218) caused fuel to overflow from the emergency vent. The pipeline contains approximately 3000 litres (L) of fuel, and the tank still had approximately 1000 L worth of space left until full capacity. Excess fuel spilled down inside the secondary containment lined berm where it was contained for the duration of the incident until it was cleaned up. Contaminated soil removal from the Fuel Tank Farm and proper disposal will take place as soon as practical following the 2024 thaw period. The spill was reported to the 24-hour spill report line.

5.3 Quantities

The following quantities of waste were observed in 2023:

- From July 27 to September 2, 2007.33 m^3 of sewage effluent was decanted (during eleven events) into the fjord.
- Every month, the Site produces approximately 1,557 kilograms (kg) of household waste. It is subsequently incinerated, and the ash is sent to the Non-Hazardous Solid Waste Disposal Facility. The remainder of non-incinerable waste is also transported to this Facility.
- On an average year, 4 barrels of waste, 1 barrel of waste oil filters, 2 barrels of incinerator ash, and 1 barrel of used batteries are generated. Quantities vary from year to year. The waste barrels are then stored in a lined area in the Fuel Tank Farm until they are transported off-site for disposal at a licenced hazardous waste facility. An estimated 10,500 litres (3 barrels) of liquid and solid waste (e.g., oil, fuel, detergent, antifreeze, fuel, ash, batteries, filters) was removed from the Site in 2023 via sealift for disposal at an approved facility.

6. Water Quality Monitoring Results

Routine water quality samples were collected in 2023 as part of the Water License Monitoring Program at the following location:

- EUR 3: Sewage water sample collected at the Sewage Lagoon prior to decanting

Water quality samples were not taken at the other four monitoring locations due to the absence of runoff.

There were no seeps observed within the quarry during the 2023 construction season. Ongoing melt water from within the watershed is present from time to time within the quarry and natural drainage paths at various times throughout the season. Thawing of permafrost at the base of the active layer after removal of thawed quarry materials was observed throughout West Remus quarry. Further thawing allowed melt water to naturally subside.

Water quality results for the Sewage Lagoon (EUR-3) in July were compared to the maximum concentration of parameters allowed in the Type 'B' Water Licence 8BC-EUR2131 and are presented in **Table 3**. **Appendix B** contains the laboratory data. No exceedances were reported from the water quality samples in relation to the water license. The purpose of the new wastewater treatment plant is to improve the lagoon water quality.

Table 3: Sewage Lagoon (EUR-3) Water Quality Parameters and Results July 2023

Parameter	Units	EUR-3	Maximum Concentration Guideline
Biochemical Oxygen Demand	mg/L	40	100
Total Suspended Solids	mg/L	74	120
Fecal Coliforms	CFU/100 mL	Bdl*	1×10^6
pH	pH units	8.57	6.0-9.0
Oil and Grease	Visible sheen	No Visible Sheen	No Visible Sheen

*Below the detection limit

Domestic water sampling was conducted in April and May and included sample collection of raw water in the freshwater lagoon, chlorinated water in the Eureka Main Complex Tank, pumphouse water tank, tap water and reverse osmosis drinking water.

All water quality sampling results are provided in **Appendix B**.

7. Water Licence Inspection

The 2023 CIRNAC inspection report identified five (5) non-compliance items in the Type 'B' Water License 8BC-EUR2131. ECCC responded with proposed mitigation measures on October 13, which are provided in **Appendix C.** At the time of this report, CIRNAC has not responded to the proposed mitigation measures.

There are two non-compliance items that have since been addressed by NWB

- Non-compliance item #4 – which recommends that all spills, no matter the size, be reported through the 24-hour spill line; and
- Non-compliance item #5- which recommends moving the sewage effluent discharge line a minimum of 31 metres from the high water mark.

With respect to non-compliance item #4 - NWB confirmed in a meeting on January 9, 2023 that ECCC is not required to report spills to the 24-hour reporting line unless they exceed the threshold outlined in the *Spill Contingency Planning and Reporting Regulations for Nunavut*. ECCC will continue to implement the *Emergency Plan for Petroleum and Allied Petroleum Products* previously approved by the NWB.

Furthermore, with respect to non-compliance item #5, NWB confirmed on March 1 that design of the Wastewater treatment facility is approved by the NWB, and therefore this is not an issue at Eureka HAWS.

Ongoing work site inspections throughout the work season include inspections of all fuel tanks for leakage/damage. Areas of concern noted during these daily inspections are documented through the reporting system as either a Spill or Equipment Damage event.

8. Revisions to Applicable Management Plans

A revised Remedial Action Plan was submitted on March 31, 2023 as part of the application package to request for a Licence Modification (NWB, 2023) related to construction of the new Soil Treatment Facility/landfarm. This revised version supersedes the original 2021 submission.

9. Progressive Reclamation Work Undertaken in 2023

Progressive reclamation has continued in the West Remus quarry. Reclamation and regrading of the depleted areas of the quarry is ongoing. Reclamation activities include shaping and sloping of the disturbed areas to create positive drainage and natural looking surface contours, similar to the appearance prior to disturbance. The natural drainage path through the quarry area will be maintained/restored at completion of the Project. Progressive reclamation activity will continue in the West Remus Creek area throughout the 2024 season.

10. Public Consultation

The Hamlet Council of Grise Fiord and the Iviq Hunters and Trappers Organization were both sent a letter in June 2023 to provide project updates and request that they connect with ECCC should they have any questions or comments about the Project.

11. Closure

Should the Nunavut Water Board have any questions or concerns regarding this document, please contact the undersigned.

Sincerely,
Environment and Climate Change Canada

CloutierDussault, JeanPhilippe

Signature numérique de CloutierDussault, JeanPhilippe
Date : 2024.03.27 11:43:28 -04'00'

Jean-Philippe Cloutier-Dussault
Property Manager, Assets, Real Property and Security Directorate
Environment and Climate Change Canada / Government of Canada
jean-philippe.cloutier-dussault@ec.gc.ca / Tel. : 514-641-8753

12. References

Arcadis Canada Inc. (Arcadis), 2018:

Environmental Impact Assessment Addendum for the High Arctic Weather Station Project Improvements for: Construction of New Road, Construction of Water Crossing over Black Top Creek, and Development of New Quarry Site. March 2018. Prepared for Public Services and Procurement Canada.

CCME (Canadian Council for Ministers of the Environment), 2001:

Canadian Water Quality Guidelines for the Protections of Aquatic Life. CCME Water Quality Index 1.0 Technical Report. 13pp.

Health Canada, 2020:

Guidelines for Canadian Drinking Water Quality—Summary Table. Water and Air Quality Bureau, Healthy Environments and Consumer Safety Branch, Health Canada, Ottawa, Ontario.

Nunavut Water Board (NWB), 2021:

NWB Amended Renewal Water License No: 8BC-EUR2131

Nunavut Water Board (NWB), 2023

Modification of Water license No. 8BC-EUR2131

NWB Annual Report **Year being reported:** Select 2023

License No: 8BC-EUR2131 **Issued Date:** July 22, 2021
Expiry Date: July 21, 2031

Project Name: Eureka High Arctic Weather Station

Licensee: Environment and Climate Change Canada.

Mailing Address:
160 Chemin Tour-de-l'isle
Montreal, QC H3C 4G8
for Eureka Weather Station, Eureka, NU, X0A 0G0

Name of Company filing Annual Report (if different from Name of Licensee please clarify relationship between the two entities, if applicable):

AECOM Canada Ltd. Regulatory Contractor of Environment and Climate Change Canada

General Background Information on the Project (*optional):

The Eureka High Arctic Weather Station (HAWS; the Project; the site) is located on the north side of Slidre Fjord, at the northwestern tip of Fosheim Peninsula, Ellesmere Island, NU. Since 1947, Environment & Climate Change Canada (ECCC) has owned and managed the overall operations and maintenance of the site under Land Reserve #1021. The total area of the Project is approximately 2.23 hectares. There are presently 15 primary buildings and other facilities at the HAWS. The Eureka runway is located 1.5 kilometres northeast of the HAWS main site and is the primary way by which the HAWS is accessed year-round.
The Eureka HAWS is an operational weather monitoring facility as well as a hub of activity for the Department of National Defence (DND), the Polar Continental Shelf Project and the Polar Environment Atmospheric Research Lab. Additional sites at Eureka are operated by the Canadian Network for the Detection of Atmospheric Change including the PEARL and the Surface and Atmospheric Flux, Irradiance and Radiation Extension and Zero Altitude PEARL Auxiliary Laboratory.

Licence Requirements: the licensee must provide the following information in accodance with

Part B Item 1

A summary report of water use and waste disposal activities, including, but not limited to: methods of obtaining water; sewage and greywater management; drill waste management; solid and hazardous waste management.

Water Source(s): Station Creek

Water Quantity:	
10000	Quantity Allowable Domestic camp and other
1769	Actual Quantity Used Domestic (cu.m)
	Quantity Allowable Drilling
	Total Quantity Used Drilling (cu.m)

Waste Management and/or Disposal

- [x] Solid Waste Disposal
- [x] Sewage
- [ ] Drill Waste
- [x] Greywater

☐ Hazardous
☐ Other:

Additional Details:

Please see attached report.

A list of unauthorized discharges and a summary of follow-up actions taken.

Spill No.: (as reported to the Spill Hot-line)
Date of Spill: August 27, 2023
Date of Notification to an Inspector: August 27, 2023
Additional Details: (impacts to water, mitigation measures, short/long term monitoring, etc)

Miscalculation during fuel resupply to fuel tank. See Section 5 of Report.

Revisions to the Spill Contingency Plan

N/A - not applicable

Additional Details:

Revisions to the Abandonment and Restoration Plan

N/A - not applicable

Additional Details:

Progressive Reclamation Work Undertaken

Additional Details (i.e., work completed and future works proposed)

Please see attached report.

Results of the Monitoring Program including:

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each

Details attached

Additional Details:

Please see attached report.

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each

Details attached

Additional Details:

Please see attached report.

Results of any additional sampling and/or analysis that was requested by an Inspector

No additional sampling requested by an Inspector or the Board

Additional Details: (date of request, analysis of results, data attached, etc)

Any other details on water use or waste disposal requested by the Board by November 1 of the year being

No additional sampling requested by an Inspector or the Board

Additional Details: (Attached or provided below)

Any responses or follow-up actions on inspection/compliance reports

Inspection Report received by the Licensee (Date):

Additional Details: (Dates of Report, Follow-up by the Licensee)

Dated September 18, 2023. See attached report Appendix D for details.

Any additional comments or information for the Board to consider

Date Submitted:		
Submitted/Prepared by:		
Contact Information:	**Tel:**	
	Fax:	
	email:	

AECOM Imagine it. Delivered.

Appendix B

Water Quality Sampling- Raw Data

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

Taiga Batch No.: 230467

- FINAL REPORT -

Prepared For: Environment Canada

Address: 123 Main Street
Suite 150
Winnipeg,MB
R3C 4W2

Attn: **Jean-Philippe Cloutier-Dussault** **Facsimile:**

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: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 230467

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Main Complex EUMC0412 **Taiga Sample ID:** 001

Client Project: Domestic Water
Sample Type: Water
Received Date: 13-Apr-23
Sampling Date: 12-Apr-23
Sampling Time: 15:00
Location:
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	147	0.1	mg/L	18-Apr-23	TEL035	
Hardness	661	0.7	mg/L	18-Apr-23	TEL035	
Magnesium	71.6	0.1	mg/L	18-Apr-23	TEL035	
Sodium	147	0.1	mg/L	18-Apr-23	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	< 0.005	0.005	mg/L	24-Apr-23	TEL068	
Organic Carbon, Total	2.5	0.5	mg/L	14-Apr-23	TEL033	
Phosphorous, Total	< 0.002	0.002	mg/L	24-Apr-23	TEL069	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	158	0.4	mg/L	13-Apr-23	TEL060	
Chlorine, Residual	0.02	0.01	mg/L	13-Apr-23	TEL049	
Chlorine, Total	0.11	0.01	mg/L	13-Apr-23	TEL049	
pH	7.93		pH units	13-Apr-23	TEL058	
Solids, Total Dissolved	1210	10	mg/L	17-Apr-23	TEL009	
Turbidity	0.42	0.05	NTU	14-Apr-23	TEL006	

ReportDate: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 230467

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Main Complex EUMC0412 **Taiga Sample ID:** 001

Microbiology						
Coliforms, Fecal	< 1	1	CFU/100mL	13-Apr-23	TEL017	
Coliforms, Total	< 1.0	1	MPN/100ml	13-Apr-23	TEL053	
Escherichia coli	< 1.0	1	MPN/100ml	13-Apr-23	TEL053	
Organics						
Bromodichloromethane	25.5	1	ug/L	17-Apr-23	TEL074	110
Bromoform	85.6	1	ug/L	17-Apr-23	TEL074	110
Chloroform	6.3	1	ug/L	17-Apr-23	TEL074	110
Dibromochloromethane	81.6	1	ug/L	17-Apr-23	TEL074	110
Oil and Grease, visible	Non-visible			13-Apr-23	Visual Exam	
Trihalomethanes, Total	199	1	ug/L	17-Apr-23	TEL074	110
Trace Metals, Total						
Aluminum	10.4	0.6	µg/L	18-Apr-23	TEL035	
Antimony	< 0.1	0.1	µg/L	18-Apr-23	TEL035	
Arsenic	0.3	0.2	µg/L	18-Apr-23	TEL035	
Barium	17.2	0.1	µg/L	18-Apr-23	TEL035	
Beryllium	< 0.1	0.1	µg/L	18-Apr-23	TEL035	
Bismuth	< 0.2	0.2	µg/L	18-Apr-23	TEL035	
Boron	106	0.9	µg/L	18-Apr-23	TEL035	
Cadmium	< 0.04	0.04	µg/L	18-Apr-23	TEL035	
Cesium	< 0.1	0.1	µg/L	18-Apr-23	TEL035	
Chromium	0.2	0.1	µg/L	18-Apr-23	TEL035	
Cobalt	< 0.1	0.1	µg/L	18-Apr-23	TEL035	
Copper	18.1	0.2	µg/L	18-Apr-23	TEL035	
Iron	36	5	ug/L	18-Apr-23	TEL035	

ReportDate: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 230467

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Main Complex EUMC0412 **Taiga Sample ID:** 001

Lead	0.3	0.1	µg/L	18-Apr-23	TEL035
Lithium	26.4	0.2	µg/L	18-Apr-23	TEL035
Manganese	5.7	0.1	µg/L	18-Apr-23	TEL035
Mercury	< 0.01	0.01	µg/L	18-Apr-23	TEL035
Molybdenum	0.3	0.1	µg/L	18-Apr-23	TEL035
Nickel	3.9	0.1	µg/L	18-Apr-23	TEL035
Rubidium	2.7	0.1	µg/L	18-Apr-23	TEL035
Selenium	0.7	0.3	µg/L	18-Apr-23	TEL035
Silver	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Strontium	643	0.1	µg/L	18-Apr-23	TEL035
Thallium	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Tin	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Titanium	0.4	0.1	µg/L	18-Apr-23	TEL035
Uranium	0.8	0.1	µg/L	18-Apr-23	TEL035
Vanadium	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Zinc	114	0.4	µg/L	18-Apr-23	TEL035

ReportDate: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 230467

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Reverse Osmosis EURO0412 **Taiga Sample ID:** 002

Client Project: Domestic Water
Sample Type: Water
Received Date: 13-Apr-23
Sampling Date: 12-Apr-23
Sampling Time: 13:25
Location:
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	1.2	0.1	mg/L	18-Apr-23	TEL035	
Hardness	5.6	0.7	mg/L	18-Apr-23	TEL035	
Magnesium	0.6	0.1	mg/L	18-Apr-23	TEL035	
Sodium	5.2	0.1	mg/L	18-Apr-23	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	< 0.005	0.005	mg/L	24-Apr-23	TEL068	
Organic Carbon, Total	< 0.5	0.5	mg/L	14-Apr-23	TEL033	
Phosphorous, Total	< 0.002	0.002	mg/L	24-Apr-23	TEL069	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	4.0	0.4	mg/L	13-Apr-23	TEL060	
Chlorine, Residual	< 0.01	0.01	mg/L	13-Apr-23	TEL049	
Chlorine, Total	0.01	0.01	mg/L	13-Apr-23	TEL049	
pH	6.69		pH units	13-Apr-23	TEL058	
Solids, Total Dissolved	11	10	mg/L	17-Apr-23	TEL009	
Turbidity	0.07	0.05	NTU	14-Apr-23	TEL006	
Microbiology						

ReportDate: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 230467

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Reverse Osmosis EURO0412 **Taiga Sample ID:** 002

Coliforms, Fecal	< 1	1	CFU/100mL	13-Apr-23	TEL017	
Coliforms, Total	< 1.0	1	MPN/100ml	13-Apr-23	TEL053	
Escherichia coli	< 1.0	1	MPN/100ml	13-Apr-23	TEL053	
Organics						
Bromodichloromethane	4.7	1	ug/L	17-Apr-23	TEL074	110
Bromoform	2.5	1	ug/L	17-Apr-23	TEL074	110
Chloroform	3.1	1	ug/L	17-Apr-23	TEL074	110
Dibromochloromethane	5.7	1	ug/L	17-Apr-23	TEL074	110
Oil and Grease, visible	Non-visible			13-Apr-23	Visual Exam	
Trihalomethanes, Total	16.0	1	ug/L	17-Apr-23	TEL074	110
Trace Metals, Total						
Aluminum	< 0.6	0.6	µg/L	18-Apr-23	TEL035	
Antimony	< 0.1	0.1	µg/L	18-Apr-23	TEL035	
Arsenic	< 0.2	0.2	µg/L	18-Apr-23	TEL035	
Barium	< 0.1	0.1	µg/L	18-Apr-23	TEL035	
Beryllium	< 0.1	0.1	µg/L	18-Apr-23	TEL035	
Bismuth	< 0.2	0.2	µg/L	18-Apr-23	TEL035	
Boron	59.7	0.9	µg/L	18-Apr-23	TEL035	
Cadmium	< 0.04	0.04	µg/L	18-Apr-23	TEL035	
Cesium	< 0.1	0.1	µg/L	18-Apr-23	TEL035	
Chromium	< 0.1	0.1	µg/L	18-Apr-23	TEL035	
Cobalt	< 0.1	0.1	µg/L	18-Apr-23	TEL035	
Copper	25.2	0.2	µg/L	18-Apr-23	TEL035	
Iron	< 5	5	ug/L	18-Apr-23	TEL035	
Lead	0.6	0.1	µg/L	18-Apr-23	TEL035	

ReportDate: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 230467

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Reverse Osmosis EURO0412 **Taiga Sample ID:** 002

Lithium	0.7	0.2	µg/L	18-Apr-23	TEL035
Manganese	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Mercury	< 0.01	0.01	µg/L	18-Apr-23	TEL035
Molybdenum	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Nickel	0.3	0.1	µg/L	18-Apr-23	TEL035
Rubidium	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Selenium	< 0.3	0.3	µg/L	18-Apr-23	TEL035
Silver	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Strontium	4.2	0.1	µg/L	18-Apr-23	TEL035
Thallium	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Tin	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Titanium	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Uranium	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Vanadium	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Zinc	169	0.4	µg/L	18-Apr-23	TEL035

ReportDate: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 230467

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Weather Office Tap EUWO0412 **Taiga Sample ID:** 003

Client Project: Domestic Water
Sample Type: Water
Received Date: 13-Apr-23
Sampling Date: 12-Apr-23
Sampling Time: 13:15
Location:
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	139	0.1	mg/L	18-Apr-23	TEL035	
Hardness	636	0.7	mg/L	18-Apr-23	TEL035	
Magnesium	70.1	0.1	mg/L	18-Apr-23	TEL035	
Sodium	142	0.1	mg/L	18-Apr-23	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	< 0.005	0.005	mg/L	24-Apr-23	TEL068	
Organic Carbon, Total	2.6	0.5	mg/L	14-Apr-23	TEL033	
Phosphorous, Total	< 0.002	0.002	mg/L	24-Apr-23	TEL069	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	157	0.4	mg/L	13-Apr-23	TEL060	
Chlorine, Residual	< 0.01	0.01	mg/L	13-Apr-23	TEL049	
Chlorine, Total	0.03	0.01	mg/L	13-Apr-23	TEL049	
pH	7.94		pH units	13-Apr-23	TEL058	
Solids, Total Dissolved	1180	10	mg/L	17-Apr-23	TEL009	
Turbidity	0.14	0.05	NTU	14-Apr-23	TEL006	
Microbiology						

ReportDate: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 230467

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Weather Office Tap EUWO0412 **Taiga Sample ID:** 003

Coliforms, Fecal	< 1	1	CFU/100mL	13-Apr-23	TEL017
Coliforms, Total	< 1.0	1	MPN/100ml	13-Apr-23	TEL053
Escherichia coli	< 1.0	1	MPN/100ml	13-Apr-23	TEL053
Organics					
Bromodichloromethane	23.2	1	ug/L	17-Apr-23	TEL074
Bromoform	75.6	1	ug/L	17-Apr-23	TEL074
Chloroform	5.9	1	ug/L	17-Apr-23	TEL074
Dibromochloromethane	73.5	1	ug/L	17-Apr-23	TEL074
Oil and Grease, visible	Non-visible			13-Apr-23	Visual Exam
Trihalomethanes, Total	178	1	ug/L	17-Apr-23	TEL074
Trace Metals, Total					
Aluminum	2.4	0.6	µg/L	18-Apr-23	TEL035
Antimony	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Arsenic	0.3	0.2	µg/L	18-Apr-23	TEL035
Barium	10.6	0.1	µg/L	18-Apr-23	TEL035
Beryllium	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Bismuth	< 0.2	0.2	µg/L	18-Apr-23	TEL035
Boron	103	0.9	µg/L	18-Apr-23	TEL035
Cadmium	< 0.04	0.04	µg/L	18-Apr-23	TEL035
Cesium	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Chromium	0.2	0.1	µg/L	18-Apr-23	TEL035
Cobalt	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Copper	243	0.2	µg/L	18-Apr-23	TEL035
Iron	< 5	5	ug/L	18-Apr-23	TEL035
Lead	0.5	0.1	µg/L	18-Apr-23	TEL035

ReportDate: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 230467

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Weather Office Tap EUWO0412 **Taiga Sample ID:** 003

Lithium	26.4	0.2	µg/L	18-Apr-23	TEL035
Manganese	1.9	0.1	µg/L	18-Apr-23	TEL035
Mercury	< 0.01	0.01	µg/L	18-Apr-23	TEL035
Molybdenum	0.3	0.1	µg/L	18-Apr-23	TEL035
Nickel	5.7	0.1	µg/L	18-Apr-23	TEL035
Rubidium	3.2	0.1	µg/L	18-Apr-23	TEL035
Selenium	0.7	0.3	µg/L	18-Apr-23	TEL035
Silver	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Strontium	580	0.1	µg/L	18-Apr-23	TEL035
Thallium	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Tin	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Titanium	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Uranium	0.8	0.1	µg/L	18-Apr-23	TEL035
Vanadium	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Zinc	162	0.4	µg/L	18-Apr-23	TEL035

ReportDate: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 230467

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Freshwater Lagoon EUWL0412 **Taiga Sample ID:** 004

Client Project: Domestic Water
Sample Type: Water
Received Date: 13-Apr-23
Sampling Date: 12-Apr-23
Sampling Time: 14:45
Location:
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	185	0.1	mg/L	18-Apr-23	TEL035	
Hardness	833	0.7	mg/L	18-Apr-23	TEL035	
Magnesium	90.3	0.1	mg/L	18-Apr-23	TEL035	
Sodium	179	0.1	mg/L	18-Apr-23	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	< 0.005	0.005	mg/L	24-Apr-23	TEL068	
Organic Carbon, Total	3.9	0.5	mg/L	14-Apr-23	TEL033	
Phosphorous, Total	0.004	0.002	mg/L	24-Apr-23	TEL069	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	206	0.4	mg/L	13-Apr-23	TEL060	
Chlorine, Residual	0.01	0.01	mg/L	13-Apr-23	TEL049	
Chlorine, Total	0.01	0.01	mg/L	13-Apr-23	TEL049	
pH	7.45		pH units	13-Apr-23	TEL058	
Solids, Total Dissolved	1570	10	mg/L	17-Apr-23	TEL009	
Turbidity	0.46	0.05	NTU	14-Apr-23	TEL006	
Microbiology						

ReportDate: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 230467

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Freshwater Lagoon EUWL0412 **Taiga Sample ID:** 004

Coliforms, Fecal	< 1	1	CFU/100mL	13-Apr-23	TEL017	
Coliforms, Total	< 1.0	1	MPN/100ml	13-Apr-23	TEL053	
Escherichia coli	< 1.0	1	MPN/100ml	13-Apr-23	TEL053	
Organics						
Bromodichloromethane		1	ug/L		TEL074	111 111
Bromoform		1	ug/L		TEL074	111 111
Chloroform		1	ug/L		TEL074	111 111
Dibromochloromethane		1	ug/L		TEL074	111 111
Oil and Grease, visible	Non-visible			13-Apr-23	Visual Exam	
Trihalomethanes, Total		1	ug/L		TEL074	111 111
Trace Metals, Total						
Aluminum	11.7	0.6	µg/L	18-Apr-23	TEL035	
Antimony	0.2	0.1	µg/L	18-Apr-23	TEL035	
Arsenic	0.5	0.2	µg/L	18-Apr-23	TEL035	
Barium	21.4	0.1	µg/L	18-Apr-23	TEL035	
Beryllium	< 0.1	0.1	µg/L	18-Apr-23	TEL035	
Bismuth	< 0.2	0.2	µg/L	18-Apr-23	TEL035	
Boron	130	0.9	µg/L	18-Apr-23	TEL035	
Cadmium	< 0.04	0.04	µg/L	18-Apr-23	TEL035	
Cesium	< 0.1	0.1	µg/L	18-Apr-23	TEL035	
Chromium	0.4	0.1	µg/L	18-Apr-23	TEL035	
Cobalt	0.1	0.1	µg/L	18-Apr-23	TEL035	
Copper	1.1	0.2	µg/L	18-Apr-23	TEL035	
Iron	15	5	ug/L	18-Apr-23	TEL035	
Lead	< 0.1	0.1	µg/L	18-Apr-23	TEL035	

ReportDate: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 230467

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Freshwater Lagoon EUWL0412 **Taiga Sample ID:** 004

Lithium	31.2	0.2	µg/L	18-Apr-23	TEL035
Manganese	7.8	0.1	µg/L	18-Apr-23	TEL035
Mercury	< 0.01	0.01	µg/L	18-Apr-23	TEL035
Molybdenum	0.4	0.1	µg/L	18-Apr-23	TEL035
Nickel	5.0	0.1	µg/L	18-Apr-23	TEL035
Rubidium	3.6	0.1	µg/L	18-Apr-23	TEL035
Selenium	0.9	0.3	µg/L	18-Apr-23	TEL035
Silver	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Strontium	839	0.1	µg/L	18-Apr-23	TEL035
Thallium	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Tin	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Titanium	0.6	0.1	µg/L	18-Apr-23	TEL035
Uranium	1.0	0.1	µg/L	18-Apr-23	TEL035
Vanadium	0.1	0.1	µg/L	18-Apr-23	TEL035
Zinc	3.8	0.4	µg/L	18-Apr-23	TEL035

ReportDate: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 230467

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Water Tank - Pumphouse EOPH0412 **Taiga Sample ID:** 005

Client Project: Domestic Water
Sample Type: Water
Received Date: 13-Apr-23
Sampling Date: 12-Apr-23
Sampling Time: 14:25
Location:
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	155	0.1	mg/L	18-Apr-23	TEL035	
Hardness	703	0.7	mg/L	18-Apr-23	TEL035	
Magnesium	76.8	0.1	mg/L	18-Apr-23	TEL035	
Sodium	159	0.1	mg/L	18-Apr-23	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	< 0.005	0.005	mg/L	24-Apr-23	TEL068	
Organic Carbon, Total	2.8	0.5	mg/L	14-Apr-23	TEL033	
Phosphorous, Total	0.003	0.002	mg/L	24-Apr-23	TEL069	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	172	0.4	mg/L	13-Apr-23	TEL060	
Chlorine, Residual	0.02	0.01	mg/L	13-Apr-23	TEL049	
Chlorine, Total	0.12	0.01	mg/L	13-Apr-23	TEL049	
pH	7.85		pH units	13-Apr-23	TEL058	
Solids, Total Dissolved	1300	10	mg/L	17-Apr-23	TEL009	
Turbidity	2.29	0.05	NTU	14-Apr-23	TEL006	
Microbiology						

ReportDate: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 230467

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Water Tank - Pumphouse EOPH0412 **Taiga Sample ID:** 005

Coliforms, Fecal	< 1	1	CFU/100mL	13-Apr-23	TEL017	
Coliforms, Total	< 1.0	1	MPN/100ml	13-Apr-23	TEL053	
Escherichia coli	< 1.0	1	MPN/100ml	13-Apr-23	TEL053	
Organics						
Bromodichloromethane	29.7	1	ug/L	17-Apr-23	TEL074	110
Bromoform	94.3	1	ug/L	17-Apr-23	TEL074	110
Chloroform	7.2	1	ug/L	17-Apr-23	TEL074	110
Dibromochloromethane	94.1	1	ug/L	17-Apr-23	TEL074	110
Oil and Grease, visible	Non-visible			13-Apr-23	Visual Exam	
Trihalomethanes, Total	225	1	ug/L	17-Apr-23	TEL074	110
Trace Metals, Total						
Aluminum	22.8	0.6	µg/L	18-Apr-23	TEL035	
Antimony	0.1	0.1	µg/L	18-Apr-23	TEL035	
Arsenic	0.3	0.2	µg/L	18-Apr-23	TEL035	
Barium	19.1	0.1	µg/L	18-Apr-23	TEL035	
Beryllium	< 0.1	0.1	µg/L	18-Apr-23	TEL035	
Bismuth	< 0.2	0.2	µg/L	18-Apr-23	TEL035	
Boron	110	0.9	µg/L	18-Apr-23	TEL035	
Cadmium	< 0.04	0.04	µg/L	18-Apr-23	TEL035	
Cesium	< 0.1	0.1	µg/L	18-Apr-23	TEL035	
Chromium	0.2	0.1	µg/L	18-Apr-23	TEL035	
Cobalt	0.1	0.1	µg/L	18-Apr-23	TEL035	
Copper	3.4	0.2	µg/L	18-Apr-23	TEL035	
Iron	192	5	ug/L	18-Apr-23	TEL035	
Lead	1.4	0.1	µg/L	18-Apr-23	TEL035	

ReportDate: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 230467

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Water Tank - Pumphouse EOPH0412 **Taiga Sample ID:** 005

Lithium	24.8	0.2	µg/L	18-Apr-23	TEL035
Manganese	5.6	0.1	µg/L	18-Apr-23	TEL035
Mercury	< 0.01	0.01	µg/L	18-Apr-23	TEL035
Molybdenum	0.3	0.1	µg/L	18-Apr-23	TEL035
Nickel	3.9	0.1	µg/L	18-Apr-23	TEL035
Rubidium	3.2	0.1	µg/L	18-Apr-23	TEL035
Selenium	0.7	0.3	µg/L	18-Apr-23	TEL035
Silver	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Strontium	676	0.1	µg/L	18-Apr-23	TEL035
Thallium	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Tin	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Titanium	0.4	0.1	µg/L	18-Apr-23	TEL035
Uranium	0.8	0.1	µg/L	18-Apr-23	TEL035
Vanadium	< 0.1	0.1	µg/L	18-Apr-23	TEL035
Zinc	13.2	0.4	µg/L	18-Apr-23	TEL035

ReportDate: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 230467

- CERTIFICATE OF ANALYSIS -

Client Sample ID: Water Tank - Pumphouse EOPH0412 **Taiga Sample ID:** 005

- DATA QUALIFERS -

Data Qualifier Descriptions:

110 *Reported result uncertain, due to air in vial.*

111 *Vial contained air bubble, analysis not possible*

*** 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: April 30, 2023
Print Date: *April 30, 2023*

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

Taiga Batch No.: 231032

- FINAL REPORT -

Prepared For: Environment Canada

Address: 123 Main Street
Suite 150
Winnipeg,MB
R3C 4W2

Attn: **Don Lavallee** **Facsimile:**

Final report has been reviewed and approved by:

Glen Hudy
Quality Assurance Officer

NOTES:

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

ReportDate: July 31, 2023
Print Date: *August 2, 2023*

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

Taiga Batch No.: 231032

- CERTIFICATE OF ANALYSIS -

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

Client Project: Sewage Lagoon Sampling
Sample Type: Sewage Lagoon
Received Date: 10-Jul-23
Sampling Date: 07-Jul-23
Sampling Time: 8:45
Location: Eureka, Nunavut
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	80.3	0.1	mg/L	14-Jul-23	TEL035	
Hardness	361	0.7	mg/L	14-Jul-23	TEL035	
Magnesium	39.0	0.1	mg/L	14-Jul-23	TEL035	
Potassium	15.6	0.1	mg/L	14-Jul-23	TEL035	
Sodium	241	0.1	mg/L	14-Jul-23	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	15.0	0.005	mg/L	14-Jul-23	TEL068	
Biochemical Oxygen Demand	40	2	mg/L	11-Jul-23	TEL019	
Organic Carbon, Total	48.2	0.5	mg/L	21-Jul-23	TEL033	
Phosphorous, Total	2.47	0.002	mg/L	13-Jul-23	TEL069	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	171	0.4	mg/L	10-Jul-23	TEL060	
Conductivity, Specific (@25C)	1890	0.4	µS/cm	10-Jul-23	TEL059	
pH	8.57		pH units	10-Jul-23	TEL058	
Solids, Total Suspended	74	3	mg/L	16-Jul-23	TEL008	

ReportDate: July 31, 2023
Print Date: ***August 2, 2023***

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

Taiga Batch No.: 231032

- CERTIFICATE OF ANALYSIS -

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

Microbiology						
Coliforms, Fecal	2000	1	CFU/100mL	10-Jul-23	TEL017	3
Organics						
Oil and Grease, visible	Non-visible			10-Jul-23	Visual Exam	
Subcontracted Inorganics						
Chloride	329	1	mg/L	13-Jul-23	EPA300.1	
Nitrate as Nitrogen	< 0.0300	0.03	mg/L	13-Jul-23	EPA300.1	228
NO2+NO3 - N	< 0.0316	0.0316	mg/L	13-Jul-23	EPA300.1	
Sulphate	282	0.5	mg/L	13-Jul-23	EPA300.1	
Subcontracted Organics						
Phenols, Total	0.0105	0.001	mg/L	19-Jul-23	AB ENV.06537	
Trace Metals, Total						
Aluminum	42.3	6	µg/L	19-Jul-23	TEL035	207
Antimony	2.6	1	µg/L	19-Jul-23	TEL035	207
Arsenic	< 2.0	2	µg/L	19-Jul-23	TEL035	207
Barium	11.5	1	µg/L	19-Jul-23	TEL035	207
Beryllium	< 1.0	1	µg/L	19-Jul-23	TEL035	207
Cadmium	< 0.40	0.4	µg/L	19-Jul-23	TEL035	207
Cesium	< 1.0	1	µg/L	19-Jul-23	TEL035	207
Chromium	< 1.0	1	µg/L	19-Jul-23	TEL035	207
Cobalt	1.2	1	µg/L	19-Jul-23	TEL035	207
Copper	19.6	2	µg/L	19-Jul-23	TEL035	207
Iron	646	50	µg/L	19-Jul-23	TEL035	207
Lead	< 1.0	1	µg/L	19-Jul-23	TEL035	207
Lithium	20.2	2	µg/L	19-Jul-23	TEL035	207

ReportDate: July 31, 2023
Print Date: *August 2, 2023*

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

Taiga Batch No.: 231032

- CERTIFICATE OF ANALYSIS -

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

Manganese	104	1	µg/L	19-Jul-23	TEL035	207
Molybdenum	1.2	1	µg/L	19-Jul-23	TEL035	207
Nickel	5.6	1	µg/L	19-Jul-23	TEL035	207
Rubidium	9.7	1	µg/L	19-Jul-23	TEL035	207
Selenium	< 3.0	3	µg/L	19-Jul-23	TEL035	207
Silver	< 1.0	1	µg/L	19-Jul-23	TEL035	207
Strontium	314	1	µg/L	19-Jul-23	TEL035	207
Thallium	< 1.0	1	µg/L	19-Jul-23	TEL035	207
Titanium	< 1.0	1	µg/L	19-Jul-23	TEL035	207
Uranium	< 1.0	1	µg/L	19-Jul-23	TEL035	207
Vanadium	< 1.0	1	µg/L	19-Jul-23	TEL035	207
Zinc	19.2	4	µg/L	19-Jul-23	TEL035	207

ReportDate: July 31, 2023
Print Date: *August 2, 2023*

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

Taiga Batch No.: 231032

- CERTIFICATE OF ANALYSIS -

Client Sample ID: FB **Taiga Sample ID:** 002

Client Project: Sewage Lagoon Sampling
Sample Type: Water
Received Date: 10-Jul-23
Sampling Date: 07-Jul-23
Sampling Time:
Location: Eureka, Nunavut
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	< 0.1	0.1	mg/L	14-Jul-23	TEL035	
Hardness	< 0.7	0.7	mg/L	14-Jul-23	TEL035	
Magnesium	< 0.1	0.1	mg/L	14-Jul-23	TEL035	
Potassium	< 0.1	0.1	mg/L	14-Jul-23	TEL035	
Sodium	< 0.1	0.1	mg/L	14-Jul-23	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	< 0.005	0.005	mg/L	14-Jul-23	TEL068	
Biochemical Oxygen Demand	< 2	2	mg/L	11-Jul-23	TEL019	
Organic Carbon, Total	< 0.5	0.5	mg/L	21-Jul-23	TEL033	
Phosphorous, Total	< 0.002	0.002	mg/L	13-Jul-23	TEL069	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	< 0.4	0.4	mg/L	10-Jul-23	TEL060	
Conductivity, Specific (@25C)	< 0.4	0.4	µS/cm	10-Jul-23	TEL059	
pH	5.76		pH units	10-Jul-23	TEL058	
Solids, Total Suspended	< 3	3	mg/L	16-Jul-23	TEL008	
Microbiology						

ReportDate: July 31, 2023
Print Date: ***August 2, 2023***

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

Taiga Batch No.: 231032

- CERTIFICATE OF ANALYSIS -

Client Sample ID: FB **Taiga Sample ID:** 002

Coliforms, Fecal	< 1	1	CFU/100mL	10-Jul-23	TEL017	3
Organics						
Oil and Grease, visible	Non-visible			10-Jul-23	Visual Exam	
Subcontracted Inorganics						
Chloride	< 0.10	0.1	mg/L	13-Jul-23	EPA300.1	
Nitrate as Nitrogen	< 0.0030	0.003	mg/L	13-Jul-23	EPA300.1	
NO2+NO3 - N	< 0.0050	0.005	mg/L	13-Jul-23	EPA300.1	
Sulphate	< 0.05	0.05	mg/L	13-Jul-23	EPA300.1	
Subcontracted Organics						
Phenols, Total	< 0.0010	0.001	mg/L	19-Jul-23	AB ENV.06537	
Trace Metals, Total						
Aluminum	< 0.6	0.6	µg/L	19-Jul-23	TEL035	
Antimony	< 0.1	0.1	µg/L	19-Jul-23	TEL035	
Arsenic	< 0.2	0.2	µg/L	19-Jul-23	TEL035	
Barium	< 0.1	0.1	µg/L	19-Jul-23	TEL035	
Beryllium	< 0.1	0.1	µg/L	19-Jul-23	TEL035	
Cadmium	< 0.04	0.04	µg/L	19-Jul-23	TEL035	
Cesium	< 0.1	0.1	µg/L	19-Jul-23	TEL035	
Chromium	< 0.1	0.1	µg/L	19-Jul-23	TEL035	
Cobalt	< 0.1	0.1	µg/L	19-Jul-23	TEL035	
Copper	< 0.2	0.2	µg/L	19-Jul-23	TEL035	
Iron	< 5	5	ug/L	19-Jul-23	TEL035	
Lead	< 0.1	0.1	µg/L	19-Jul-23	TEL035	
Lithium	< 0.2	0.2	µg/L	19-Jul-23	TEL035	
Manganese	< 0.1	0.1	µg/L	19-Jul-23	TEL035	

ReportDate: July 31, 2023
Print Date: *August 2, 2023*

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

Taiga Batch No.: 231032

- CERTIFICATE OF ANALYSIS -

Client Sample ID: FB **Taiga Sample ID:** 002

Molybdenum	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Nickel	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Rubidium	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Selenium	< 0.3	0.3	µg/L	19-Jul-23	TEL035
Silver	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Strontium	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Thallium	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Titanium	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Uranium	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Vanadium	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Zinc	< 0.4	0.4	µg/L	19-Jul-23	TEL035

ReportDate: July 31, 2023
Print Date: *August 2, 2023*

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

Taiga Batch No.: 231032

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TB **Taiga Sample ID:** 003

Client Project: Sewage Lagoon Sampling
Sample Type: Water
Received Date: 10-Jul-23
Sampling Date: 07-Jul-23
Sampling Time:
Location: Eureka, Nunavut
Report Status: **Final**

Test Parameter	Result	Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Cations by ICP-MS						
Calcium	< 0.1	0.1	mg/L	14-Jul-23	TEL035	
Hardness	< 0.7	0.7	mg/L	14-Jul-23	TEL035	
Magnesium	< 0.1	0.1	mg/L	14-Jul-23	TEL035	
Potassium	< 0.1	0.1	mg/L	14-Jul-23	TEL035	
Sodium	< 0.1	0.1	mg/L	14-Jul-23	TEL035	
Inorganics - Nutrients						
Ammonia as Nitrogen	< 0.005	0.005	mg/L	14-Jul-23	TEL068	
Organic Carbon, Total	< 0.5	0.5	mg/L	21-Jul-23	TEL033	
Phosphorous, Total	< 0.002	0.002	mg/L	13-Jul-23	TEL069	
Inorganics - Physicals						
Alkalinity, Total (as CaCO3)	< 0.4	0.4	mg/L	10-Jul-23	TEL060	
Conductivity, Specific (@25C)	< 0.4	0.4	µS/cm	10-Jul-23	TEL059	
pH	5.55		pH units	10-Jul-23	TEL058	
Solids, Total Suspended	< 3	3	mg/L	16-Jul-23	TEL008	
Organics						
Oil and Grease, visible	Non-visible			10-Jul-23	Visual Exam	

ReportDate: July 31, 2023
Print Date: ***August 2, 2023***

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

Taiga Batch No.: 231032

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TB **Taiga Sample ID:** 003

Subcontracted Inorganics					
Chloride	< 0.10	0.1	mg/L	13-Jul-23	EPA300.1
Nitrate as Nitrogen	< 0.0030	0.003	mg/L	13-Jul-23	EPA300.1
NO2+NO3 - N	< 0.0050	0.005	mg/L	13-Jul-23	EPA300.1
Sulphate	< 0.05	0.05	mg/L	13-Jul-23	EPA300.1
Subcontracted Organics					
Phenols, Total	< 0.0010	0.001	mg/L	19-Jul-23	AB ENV.06537
Trace Metals, Total					
Aluminum	< 0.6	0.6	µg/L	19-Jul-23	TEL035
Antimony	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Arsenic	< 0.2	0.2	µg/L	19-Jul-23	TEL035
Barium	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Beryllium	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Cadmium	< 0.04	0.04	µg/L	19-Jul-23	TEL035
Cesium	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Chromium	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Cobalt	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Copper	< 0.2	0.2	µg/L	19-Jul-23	TEL035
Iron	< 5	5	ug/L	19-Jul-23	TEL035
Lead	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Lithium	< 0.2	0.2	µg/L	19-Jul-23	TEL035
Manganese	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Molybdenum	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Nickel	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Rubidium	< 0.1	0.1	µg/L	19-Jul-23	TEL035

ReportDate: July 31, 2023
Print Date: *August 2, 2023*

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

Taiga Batch No.: 231032

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TB **Taiga Sample ID:** 003

Selenium	< 0.3	0.3	µg/L	19-Jul-23	TEL035
Silver	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Strontium	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Thallium	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Titanium	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Uranium	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Vanadium	< 0.1	0.1	µg/L	19-Jul-23	TEL035
Zinc	< 0.4	0.4	µg/L	19-Jul-23	TEL035

ReportDate: July 31, 2023
Print Date: *August 2, 2023*

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

Taiga Batch No.: 231032

- CERTIFICATE OF ANALYSIS -

Client Sample ID: TB **Taiga Sample ID:** 003

- DATA QUALIFERS -

Data Qualifier Descriptions:

207	*Detection limit adjusted due to sample matrix effects*
228	*Detection Limit Raised - Dilution required due to high Dissolved Solids/Electrical Conductivity.*
3	*Holding time exceeded before receipt of sample*

*** Taiga analytical methods are based on the following standard analytical methods**

SM - Standard Methods for the Examination of Water and Wastewater

EPA - United States Environmental Protection Agency

ReportDate: July 31, 2023
Print Date: ***August 2, 2023***

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

Taiga Batch No.: 230528

- FINAL REPORT -

Prepared For: Environment Canada

Address: 123 Main Street
Suite 150
Winnipeg,MB
R3C 4W2

Attn: **Alan Gaudet** **Facsimile:**

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: May 6, 2023
Print Date: *May 6, 2023*

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

Taiga Batch No.: 230528

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EUWL0424 **Taiga Sample ID:** 001

Client Project: Domestic Water
Sample Type: Water
Received Date: 25-Apr-23
Sampling Date: 24-Apr-23
Sampling Time: 8:30
Location:
Report Status: **Final**

Test Parameter	Result		Detection Limit	Units	Analysis Date	Analytical Method *	Qualifer
Organics							
Bromodichloromethane	<	1.0	1	ug/L	03-May-23	TEL074	
Bromoform	<	1.0	1	ug/L	03-May-23	TEL074	
Chloroform	<	1.0	1	ug/L	03-May-23	TEL074	
Dibromochloromethane	<	1.0	1	ug/L	03-May-23	TEL074	
Trihalomethanes, Total	<	1.0	1	ug/L	03-May-23	TEL074	

ReportDate: May 6, 2023
Print Date: *May 6, 2023*

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

Taiga Batch No.: 230528

- CERTIFICATE OF ANALYSIS -

Client Sample ID: EUWL0424 **Taiga Sample ID:** 001

*** 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: May 6, 2023

Print Date: *May 6, 2023*

AECOM Imagine it. Delivered.

Appendix C

Water Licence Inspection and Actions

Water Licence Inspection Report

☒Original
☐Follow-Up Report

Authorization	Representative
Environment and Climate Change Canada	**Asif Mohammed**
Authorization No. / Expiry	**Representative's Title**
8BC-EUR2131, April 29,2025	**Chief Administrative Officer**
Other Authorization/s	
Activities Inspected	
☐ Camp, Commercial ☐ Drilling ☐ Mining ☐ Construction ☐ Reclamation ☐ Fuel Storage ☐ Roads/Hauling ☐ Winter Hauling ☐ Camp, Private ☒ Other ,Potable Water source, Solid Waste facility, hazardous waste facility, Domestic waste/sewage	

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	1
C: CONDITIONS APPLYING TO SECURITY	NI	
D: CONDITIONS APPLYING TO WATER USE	A	4,5,6,7,23,24-27,31,32
E: CONDITIONS APPLYING TO WASTE DISPOSAL AND MANAGEMENT	C	3,8-19,21,22,27-30,33
F: CONDITIONS APPLYING TO MODIFICATIONS	A	
G: CONDITIONS APPLYING TO CONSTRUCTION	A	
H: CONDITIONS APPLYING TO EMERGENCY RESPONSE AND CONTINGENCY PLANNING	NI	
I: CONDITIONS APPLYING TO ABANDONMENT, RECLAMATION AND CLOSURE PLANNING	NI	
J: CONDITIONS APPLYING TO MONITORING	A	
SCHEDULES	NI	

**The licence and the observation number corresponds with specific comments provided below.*

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

**refers to specific terms and conditions found in the permit/lease in question.*

Section 1 Comments

Background

The Eureka High Arctic Weather Station (HAWS) was established in 1947. The Eureka HAWS is located on the northern shore of Slidre Fiord, at the northwestern tip of Fosheim Peninsula, Ellesmere Island, approximately 425 km northwest of the Hamlet of Grise Fiord. The Eureka HAWS is sited on crown land. The Station is operated by Environment and Climate Change Canada (ECCC) since April 7th 1947. The primary purpose of the Eureka station is to collect weather information in order to produce public weather forecasts. The station also serves as a staging location for other science based activities in the High Arctic and provides support to the Arctic aviation community. Facilities at Eureka include operations, shops, accommodations and other buildings, maintenance garage, warehouses, pump-house, power-house, fuel storage facility, electrical plumbing-carpentry facilities, water reservoir, incinerator, and sewage lagoon. ECCC sought to construct and operate a new water storage reservoir, with an expected completion date of August 2024, a wastewater treatment plant that is to be commissioned in 2023, and a greywater exfiltration trench. The Applicant also indicated that it plans to convert the existing sewage lagoon into a wastewater retention pond.

Inspector Statement

On July 09, 2023, I, Isaiah James Bolt, Inspector with the Crown Indigenous Relations and Northern Affairs Canada, (CIRNAC and for the purpose of this report hereafter referred as the " Inspector"), Along with Fellow Inspector Joseph Monteith, completed an on site inspection of 8BC-EUR2131.

General Condition

1. The Nunavut Water Board acknowledges receipt March 24, 2023 of 2022 annual report, attached, for water licence 8BC-EUR2131

Inspection

2. Inspectors Bolt and Monteith arrived at the airport on site at around 1:30pm on July 09.
3. 2:45pm The Inspectors arrived at Blacktop Creek bridge. On the bridge, there is no mesh to catch the sediment build up from falling off of the edge. Sediments and rocks have built up on the centre of the bridge (Photo #1). (Part C-Subsection 7 of the water license: "*Sediment and erosion control measures shall be implemented prior to and maintained during the undertaking to prevent entry of sediment into Water.")*
4. At Blacktop creek bridge, inspectors observed installed dozer tracks up stream of the bridge to help mitigate erosion (Photo #2).
5. 3:00pm The Inspectors arrived at West Remus Creek. no concerns with the culverts or erosion mitigation at the time of arrival. (photo #3).
6. 3:08pm The Inspectors arrive at Remus Creek. Inspector BOLT noted that the walls on the down stream side of the culverts were very steep and show signs of erosion at the high water mark (Photo #4). large rocks have been placed at the bottom of the walls to help mitigate erosion. Part C-Subsection 6 of the issued water license states: "*The Licensee shall not cause erosion to the banks of any water body and shall provide necessary controls to prevent such erosion."*
7. Inspector BOLT at Remus Creek observed the erosion control measures on the upstream side of the culverts are very well designed. (photo #5)
8. 3:34pm At the Nuna Logistics storage laydown area: an articulating rock truck was observed with a spill tray underneath. (Photo #6). Upon closer inspection, it was apparent there was staining on the ground. (Photo #7)
9. Nuna Logistics has many tanks of fuel stored in their storage laydown area. All of the fuel tanks are large square tanks with a capacity of 4995 Litres (photo #8) A close up photo was taken showing the information placard of one of the tanks. (Photo #9)
10. In the Nuna storage laydown area near the stack of truck tires, 6 Acetylene tanks, a barrel and an ash barrel are stored. (photo #10)
11. A large 200lbs propane tank was observed in the Nuna Storage Laydown (Photo #11).
12. 3:49pm Battery disposal facility (ERK-04): (Photo #12). Inspector BOLT walked to the berm and took more photos, (Photo #13) shows the mound of dirt, no other loose debris other than a standing barrel half buried in the mound was observed.
13. Solid Waste Facility: (EUR-02/ERK-03) (Photo #14), wind blown litter observed. No concerns (Photo #15)
14. 3:57pm At the landfill, EUR-02, the open burn facility (metal dumpster) contained plastics and plastic bags filled with domestic wastes. (Photo #16) Domestic wastes appear to have been burned there before. (Part D-Item 5 of the issued water license states: "*The Licensee shall not open burn plastics, wood treated with preservatives, electric wire, Styrofoam, asbestos or painted wood to prevent the deposition of Waste materials of incomplete combustion and/or leachate from contaminated ash residual, from impacting any surrounding Waters, unless otherwise approved by the Board in writing."*
15. 4:04pm arrival at EUR-06. Temporary contaminated soil storage. No concerns with EUR-06 (Photo #17)
16. In the same area as EUR-06, a new contaminated soil storage berm is being built. At the time of inspection the berm walls had been constructed and the rubber liner had been placed on top and weighted down to ensure the wind doesn't blow it away. Completion of the berm will enable Nuna-logistics to store more contaminated soils on site. (Photo #18)
17. Inspectors BOLT and MONTEITH arrived at the Nuna logistics waste fuel laydown. This area is for storage of drums. Approx 112 drums were placed on this storage pad at the time of inspection. All barrels observed were placed on pallets and not secondary containment. No spills observed (Photo #19).
18. 4:09pm Arrival at the Barrel Crushing site that is also in the same area as the Land farm Facility (Photo #20).
19. A contaminated soil berm(Photo#21) in the land farm facility appears to have compromised berm walls. (Photo #22 and #23).
20. In the Barrel crushing facility, there are 2 separate stockpiles of empty barrels. 1 stockpile is close to the entrance (Photo #24). The other stockpile is directly beside the washer/crusher for convince while operating the machine. There is a spill kit on site (Photo #25).
21. 4:25pm At the Nuna mechanic Laydown area. Both Inspectors noted there were many, varying in size, oil spills. (Photos #26,27,28), Inspector MONTEITH mentioned that he did not see enough spill reports to correspond with the amount of spills observed, Inspector MONTEITH requested that spills be reported to the Spills line.

22. On the way to the water reservoir, inspectors observed a large secondary containment pad with many barrels of various hazardous materials such as waste oils, AV gas, 5W-30, used batteries. The containment pad did have some water in it. But no significant concerns were noted.
23. Inspectors BOLT and MONTEITH arrive at the new water reservoir that is under construction. Inspectors were shown a cross section. (Photo #29). The new reservoir is located right beside the old one, but it is raised up higher with large berm walls. (Photo #30)
24. Inspectors also observed the old water reservoir. (Photo #31) Water is pumped from Station Creek bridge to the reservoir. It is estimated that the reservoir holds approximately 12,000 cubic metres of water. An amendment to the water license has been issued to increase its capacity by building the new water reservoir. The free board of the old reservoir is very low, but there is a drain pipe that helps regulate the proper water level to prevent overflow. The end of the pipe flows away from the reservoir into the ocean. The end of the drain pipe is over 31 metres from the high water mark and has erosion mitigation in place.
25. The inner walls of the old water reservoir have been slumping inwards over time and may eventually cause the structure to fail. (Photo #32) The new water reservoir is scheduled to be completed in August 2024 according to the amended water license.
26. Eureka obtains its water for domestic purposes from a bridge at Station Creek. The water is pumped from Station Creek into the water reservoir using a submersible pump placed inside a milk crate covered with fine mesh in order to reduce the transfer of silt and potentially fish from the creek to the reservoir. (Photo #39 and #40)
27. Close by the new water reservoir is a site that has been staked and labelled as contaminated soil. This contaminated soil is considered a waste and will be brought to the new temporary contaminated soil berms for treatment. Contamination is very old and may come from leaks from the fuel tank farm area. (Photo #33)
28. Inspectors BOLT and MONTEITH inspected the sewage lagoon and a small building with a sump located in side (Photo #34)
29. The sewage lagoon was observed with floating debris of wood and some sludge build up on the surface. (Photo#38)
30. The sewage lagoon decanting hose was observed to be too close to the ocean. (approx. 5 Metres) When decanting, the end of the decanting effluent line should be at least 31 metres or more from the high water mark (Photo #37)
31. The Station Creek Bridge has sedimentation issues. Trucks driving over the bridge deposit sediment onto the bridge and it builds up over time. This build up then falls into the water down below which changes the characteristics of the water and while at the same time depositing sediments. (Photo # 41 and #42)
32. Raw water is taken from the water reservoir and treated. Treatments include Reverse Osmosis, UV lights, micron filters and chlorination. (Photo # 43 and #44)
33. The fuel cache located on the apron at the airstrip is acceptable to the inspectors. Almost all barrels are in secondary containment. Sorting and signage is very well done. No Concerns noted. (Photo #45)

Section 2 Non-Compliance

1. Sedimentation occurring from Blacktop Bridge and Station Creek Bridge must be mitigated. Part C -Subsection 7 of the water license states: "*Sediment and erosion control measures shall be implemented prior to and maintained during the undertaking to prevent entry of sediment into Water.*"
2. Erosion of the banks at West Remus creek shall be prevented and mitigated.
3. In regard to observation of plastics in the open burn dumpster, Part D-subsection #5 of the issued water license states: "*The Licensee shall not open burn plastics, wood treated with preservatives, electric wire, Styrofoam, asbestos or painted wood to prevent the deposition of Waste materials of incomplete combustion and/or leachate from contaminated ash residual, from impacting any surrounding Waters, unless otherwise approved by the Board in writing.*"
4. Many unreported spills were observed on site. Part G, Item 4, subsection b and c of the water license states: "*If during the term of this Licence, an unauthorized discharge of Waste occurs, or if such a discharge is foreseeable, the Licensee shall: b. Report the spill immediately to the NWT/NU 24-Hour Spill Line at (867) 920-8130 and to the Inspector at (867) 975-4295; and c. For each spill occurrence, submit to the Inspector, no later than thirty (30) days after initially reporting the event, a detailed report that will include the amount and type of spilled product, the GPS location of the spill, and the measures taken to contain and clean up the spill site.*"
5. Regarding the decanting of the sewage lagoon and the effluent line not being 31metres from the high water mark. Part D - Item 1 of the license states: "*The Licensee shall locate areas designated for Waste disposal at a minimum distance of thirty-one (31) metres from the ordinary High Water Mark of any water body such that the quality, quantity or flow of Water is not impaired, unless otherwise approved by the Board in writing.*"

Section 3 Action Required
1. Address sedimentation mitigations at Station Creek and Blacktop Creek. 2. Address the erosion of the downstream banks at Remus Creek. 3. Review Part D, Item 5 and Items 6, a-j. of 8BC-EUR2131 to become familiar with open burning conditions. 4. Report all spills to the NWT/NU Spill line. 5. Ensure the end of the effluent lines/decanting hoses are over 31 metres from the high water mark of any water body before pumping. Ensure all effluent parameter quality limits are not in exceedance.

Licensee or Representative	Inspector's Name
	Isaiah James Bolt
Signature	**Signature**
	James Bolt
Date	**Date**
	2023/09/18

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

PHOTO LOG

Date:	Authorization Number:	Camera/Model:	Inspector
Sunday, July 9, 2023	8BC-EUR2131	DSC-HX50V Sony Cyber Shot	Isaiah James Bolt

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

Description:
Image shows the BlackTop Creek Bridge. No sedimentation control of the bridge. Rocks and sediment have built up on the centre of the bridge and on either side. Sedimentation mitigations required. No mesh on the edge to stop rocks from falling in.

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

Description:

This image shows the upstream side of blacktop creek bridge and the erosion mitigation of the banks. No mesh to stop sedimentation.

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

Description:

West Remus Creek Erosion control, upstream side of the culverts.

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

Description:

Photo showing downtream of the Remus Creek culvert and the steep walls that have eroded away.

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

Description:

Photo shows excellent erosion control on the upstream side of the culverts at Remus Creek

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

Description:

Image shows an articulating rock truck with a leak tray placed under it.

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

Description:

Up close image shows stains under the articulating rock truck.

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

Description:

Image showing the fuel tanks, there are more tanks being offloaded from the truck bed.

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

Description:

This photo shows details pertaining to the fuel storange tanks in the Nuna Logistics laydown area.

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

Description:

Improper storage of Acetylene tanks at the Nuna storage laydown. Also, a fuel drum and an ash barrel is stored beside the cylinders.

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

Description:

Photo shows a large propane tank stored in the same area as the acetylene tanks at the Nuna storage laydown area.

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

Description:
Photo shows ERK-4 Signage and ERK-4 mound in the background.

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

Description:
Image shows a close view of the Mound, might have been an old berm, nothing showing on the surface except and half buried old barrel.

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

Description:

Image shows EUR-2/ERK-3 singage. Some loose debris on site.

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

Description:

Photo is taken from on top of metal dump looking over the edge to the basin below. Tires, metals, wires, plastic are all present.

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

Description:

A photo of the inside of the burn dumpster at the open burn facility. Observed Plastic bags of garbage, clear plastic from contruction activities, beer cans and unknown ash in the bottom right corner of the photo.

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

Description:

Photo shows the EUR-06 facility. In the background, a lined berm stores contaminated soil. The berm has been covered and the cover weighed down.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #18	Click or tap here to enter text.

Description:

Contruction of a new contaminated soil berm is underway. The liner has not been secured, but is weighed down with the white bags of dirt. Adjustments of the liner will be made and then the new berm will be filled with contaminated soils that have been discovered near the new raw water containment resevoir.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #19	Click or tap here to enter text.

Description:

Beside the contaminated soil berms is a waste fuel storage pad. All barrels were sitting on pallets, with no secondary containment. Approx. 112 barrels.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #20	Click or tap here to enter text.

Description:

Photo shows the barrel crushing site. The “Landfarm Facility” is located in this area as well.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #21	Click or tap here to enter text.

Description:

Photo of the contaminated soil storage berm near the barrel crusher. Tires and pallets hold the plastic and rubber in place. Some cracking on the berm walls. Water does not seem to stay contained inside the berm. See next photo.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #22	Click or tap here to enter text.

Description:
In this image you can see the outside of the berm is stained, which is potentially an indication of a compromised liner.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #23	Click or tap here to enter text.

Description:
This photo is taken of the entrance of the berm. Dark staining of the soil on the base of the berm wall can be an indication of a compromised berm liner.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #24	Click or tap here to enter text.

Description:

Image shows a stockpile of barrels in the barrel crusher site. This stockpile is separate from the barrels directly adjacent to the washer/crusher. Also, In the photo the path of drainage is shown.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #25	Click or tap here to enter text.

Description:

Stockpile of barrels ready for washing and crushing. Crushed barrels can then be buried on site. The washer/crusher is the grey cylindrical machine on wheels to the left of the barrels. Spill kits are present on site.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #26	Click or tap here to enter text.

Description:
Signs of leaks and spills on the ground at Nuna Mechanic laydown area.

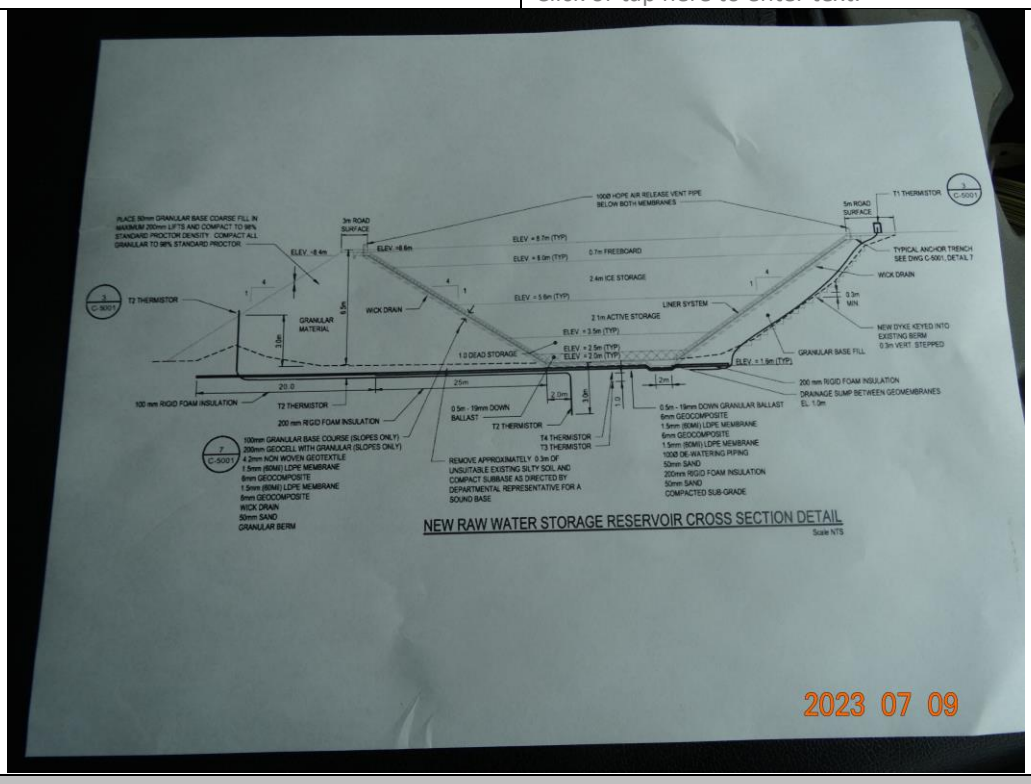
Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #27	Click or tap here to enter text.

Description:
More staining at the Nuna mechanic Laydown.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #28	Click or tap here to enter text.

Description:
Third observed spill at Nunas Mechanic Laydown area.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #29	Click or tap here to enter text.



Description:
Image shows the cross section of the new reservoir being built.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #30	Click or tap here to enter text.

Description:

Photo shows the contruction of the new water reservoir.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #31	Click or tap here to enter text.

Description:

Image shows the old water reservoir. The walls of the reservoir have been slumping over time and material is falling into the water.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #32	Click or tap here to enter text.

Description:

Image shows the inside walls of the old water reservoir slumping inward.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #33	Click or tap here to enter text.

Description:

Image shows the limits of the contaminated soils. The new water reservoir is seen on the right hand side of the image. This soil will be deposited into the new temporary contaminated soil berm, as stated by the Nuna manager.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #34	Click or tap here to enter text.

Description:
Photo shows a sewage sump in a small building before going to the sewage lagoon

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #35	Click or tap here to enter text.

Description:
This image shows the small building with the sewage sump inside of it. Sewage flows from the building through an underground pipe to the lagoon.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #36	Click or tap here to enter text.

Description:

The underground pipe resurfaces on the otherside of the road and joins into another waste pipe. The end of the piping is directly over the sewage lagoon.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #37	Click or tap here to enter text.

Description:

In this image, the hoses that are used to decant the sewage lagoon. The end of this hose approximately 5metres from the high water mark. The end of the hose should be above 31metres way from the high water mark.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #38	Click or tap here to enter text.

Description:

Loose debris and sludging observed in the sewage legoon.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #39	Click or tap here to enter text.

Description:

Raw water intake at Station creek.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #40	Click or tap here to enter text.

Description:

Raw water pumped from station creek to the water resevoir.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #41	Click or tap here to enter text.

Description:

The bridge that that crosses Station Creek is causing sedimentation.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #42	Click or tap here to enter text.

Description:
An example of the build up of sediment on the Station Creek bridge.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #43	Click or tap here to enter text.

Description:
Inside the accomodations building is the water treatment plant. Raw water is treated using a variety of techniques. In the photo, a reverse osmosis machine and a UV filter is shown.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #44	Click or tap here to enter text.

Description:

Various size micron filters are also used to help treat the water.

Photo No.	Lat/Long (DD.MM.SS.SS, NAD83)
Photo #45	Click or tap here to enter text.

Description:

This image was taken from the apron of the airstrip. Image tries to capture the Tidiness of the fuel storage. Majority of the fuel is in secondary containment and spill kits are present in the area. All the barrels are stacked on top of a steel spill containment platform.

ECCC Response to CIRNAC Inspection Report

From: Cloutier-Dussault,Jean-Philippe (ECCC) <Jean-Philippe.Cloutier-Dussault@ec.gc.ca>
Sent: Friday, October 13, 2023 3:56 PM
To: Bolt, James <James.Bolt@rcaanc-cirnac.gc.ca>
Cc: Deveau,Tony (ECCC) <Tony.Deveau@ec.gc.ca>; Ste-Marie,Marc (ECCC) <Marc.Ste-Marie@ec.gc.ca>; Radovan,Rock (il, lui | he, him) (ECCC) <Rock.Radovan@ec.gc.ca>; GPS-Eureka-SPM (ECCC) <gps-eureka-spm@ec.gc.ca>; Lazar,April (elle, la | she, her) (ECCC) <April.Lazar@ec.gc.ca>
Subject: Mitigation Measures Eureka Inspection 2023

Good day Mr. Bolt,

Following your inspection report for Eureka, please see below proposed mitigation measures.

Please do not hesitate to contact me should you require further information.

Section 3 Action Required
1. Address sedimentation mitigations at Station Creek and Blacktop Creek. 2. Address the erosion of the downstream banks at Remus Creek. 3. Review Part D, Item 5 and Items 6, a-j. of 8BC-EUR2131 to become familiar with open burning conditions. 4. Report all spills to the NWT/NU Spill line. 5. Ensure the end of the effluent lines/decanting hoses are over 31 metres from the high water mark of any water body before pumping. Ensure all effluent parameter quality limits are not in exceedance.

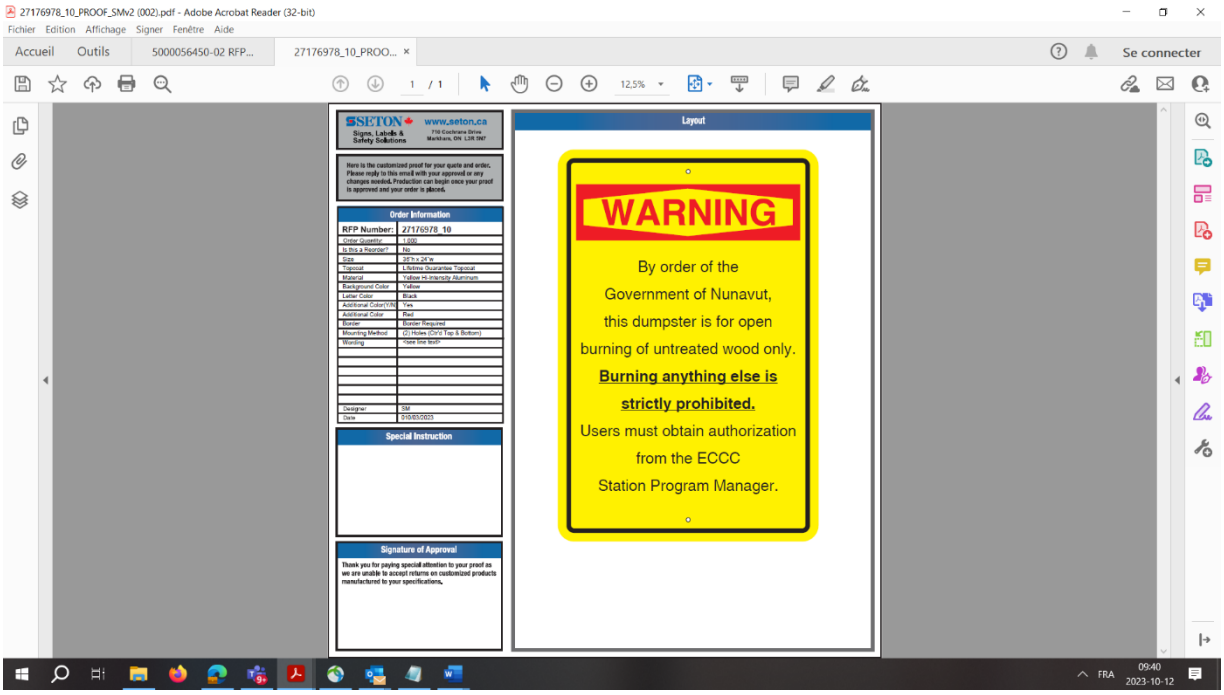
Item 1: The following mitigation measures will be implemented during project startup activities in June 2024.

1) Bumper boards will be installed on both edges of the bridge deck running surface to contain gravel and dirt that build up on the bridge deck. The bumpers will extend approximately 100 mm above the level of the deck. Similar bumpers will be installed on the bridge abutment timbers (seen in Photo #1 in the report) to prevent material from rolling off the bridge approach and entering Station Creek. As indicated by periodic inspections of the bridge, any accumulation of gravel and sediment on the bridge deck will be swept and collected for disposal a minimum of 30 away from the creek.
2) Silt fencing will be installed at the toe of the bridge embankment slopes to prevent sedimentation materials from entering the water. This will be completed both upstream and downstream of the bridge.

Item 2: Slope erosion protection will be placed on the stream banks downstream of the West Remus Creek crossing. The erosion protection may include sections of concrete canvas and geotextile fabric

anchored appropriately to prevent further erosion at the culvert outlet. Minor reshaping of the banks to flatten the slopes will be incorporated as required to achieve the installation of erosion control materials. Reshaping will be confined to areas above the water line at the time of installation.

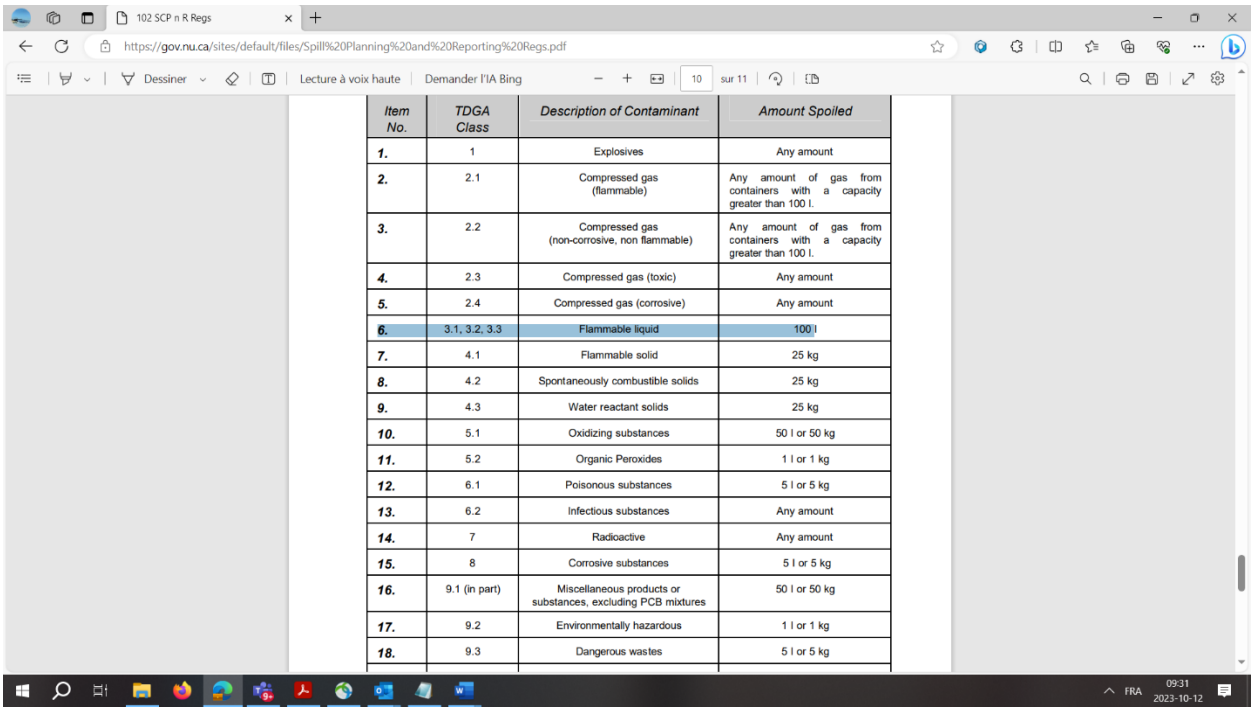
Item 3: All Eureka Station personnel and contractors have been clearly reminded about the terms and conditions of our water license. Furthermore, ECCC has ordered the sign below, which will be installed visibly next to the burning location. If problem persists, ECCC will install a cover with a locking mechanism to enforce the rules.



Item 4: Based on the photos in the report, the stains observed and categorized as unreported spills appear to be related to maintenance activities with inadequate spill control and containment devices in place. Increased diligence will be incorporated in 2024 with all operational and maintenance crews during start up, site orientation and frequently throughout the operational season to ensure that these occurrences are eliminated. It will be further enforced to report all spill to the 24-hr spill line, regardless of the spill volume, and cleaned up immediately. Detailed reports will be provided for each spill within the required 30-day requirement.

Previous spills will be cleaned up and contaminated soil properly disposed of upon our return to site in June 2024 and when ground thaw allows for proper clean up efforts.

Also, ECCC and contractor Nuna acted in good faith and were under the impression that spills under 100 liters did not need to be reported. This assumption was based on information from the Government of Nunavut website / Spill Planning and Reporting Regulations Spill Planning and Reporting Regulations | Government of Nunavut, which mention a 100 liters threshold on reporting for flammable liquid, such as fuel and hydraulic fluid.



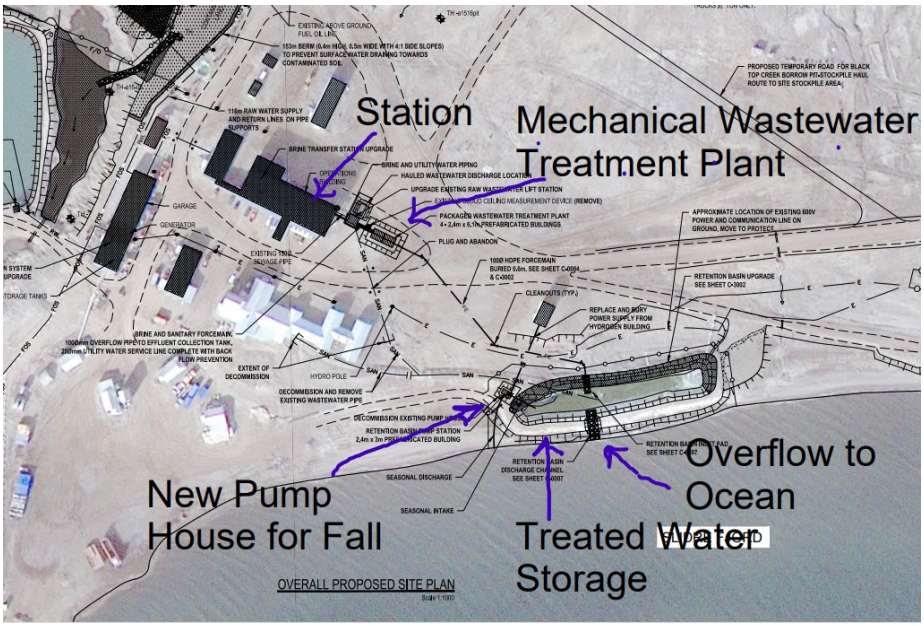
Item No.	TDGA Class	Description of Contaminant	Amount Spoiled
1.	1	Explosives	Any amount
2.	2.1	Compressed gas (flammable)	Any amount of gas from containers with a capacity greater than 100 l.
3.	2.2	Compressed gas (non-corrosive, non flammable)	Any amount of gas from containers with a capacity greater than 100 l.
4.	2.3	Compressed gas (toxic)	Any amount
5.	2.4	Compressed gas (corrosive)	Any amount
6.	3.1, 3.2, 3.3	Flammable liquid	100 l
7.	4.1	Flammable solid	25 kg
8.	4.2	Spontaneously combustible solids	25 kg
9.	4.3	Water reactant solids	25 kg
10.	5.1	Oxidizing substances	50 l or 50 kg
11.	5.2	Organic Peroxides	1 l or 1 kg
12.	6.1	Poisonous substances	5 l or 5 kg
13.	6.2	Infectious substances	Any amount
14.	7	Radioactive	Any amount
15.	8	Corrosive substances	5 l or 5 kg
16.	9.1 (in part)	Miscellaneous products or substances, excluding PCB mixtures	50 l or 50 kg
17.	9.2	Environmentally hazardous	1 l or 1 kg
18.	9.3	Dangerous wastes	5 l or 5 kg

This being said, ECCC commits to abide by the terms of water license and report all spills, regardless of the quantity in the future.

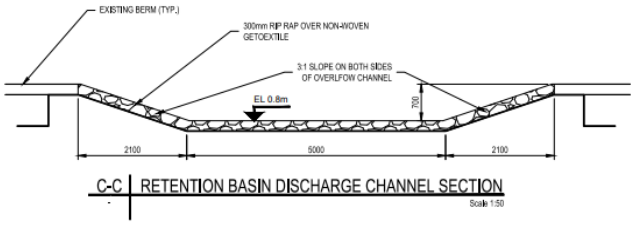
Item 5: At present the existing lagoon treats the wastewater and it is disposed of in the ocean by pumping. The discharge and pumping occurs after the lagoon has been tested and it meets license limits. The discharge is direct to the ocean, so there is very limited erosion associated with the existing pumping process. Movement of the pump discharge to 100 ft away from the ocean could be done, with enough hose and with construction of a discharge swale. However due to the conditions onsite it is believed that development of a discharge path 100 ft from the ocean could result in additional erosion, and it is not recommended. The existing lagoon treatment process is set for replacement with a mechanical treatment system and should be fully operational by 2025.

By 2025, all wastewater will be collected and treated in a moving bed bioreactor (MBBR) mechanical treatment plant adjacent to the weather station. This treatment facility will meet current Wastewater Systems Effluent Regulation (WSER) federal guidelines at well over a 100 ft from the water way. This will be high quality effluent that will be stored in the old lagoon prior to discharge. The treated water will be stored during winter rather than being released on or beneath the ocean ice. The storage cell will be the old lagoon after it is cleaned out and expanded, at which time it will be a retention pond. During the summer, the retention pond will overflow to the ocean through a channel lined with rip rap (see second drawing below). In the fall, the treated water will be pumped out of the retention pond to make space for the winter storage. Both the pumping and the overflow will be adjacent to the ocean, however they will be releasing stored treated wastewater. This outfall will not meet a 100 foot distance offset from the ocean but it will be discharging treated water meeting the WSER limits.

A figure showing the relative location for the treatment plant and the storage cell are show below.



A figure showing a cross section of the overflow channel showing rip rap and geotextile is given below:



Best regards,

Jean-Philippe Cloutier-Dussault

Gestionnaire immobilier, Directions des actifs, des biens immobiliers et de la sécurité
Environnement et Changement climatique Canada / Gouvernement du Canada
jean-philippe.cloutier-dussault@ec.gc.ca / Tél. : 514-641-8753

Property Manager, Assets, Real Property and Security Directorate
Environment and Climate Change Canada / Government of Canada
jean-philippe.cloutier-dussault@ec.gc.ca / Tel. : 514-641-8753