



Sahtu Land and Water Board

Staff Information Report #5

Applicant: Crown-Indigenous and Northern Affairs Canada (CIRNAC) – Northwest Territories Region – Contaminants and Remediation Division (CARD)	
Location: Great Bear Lake Mine Sites, Sawmill Bay, Silver Bear Mines, El Bonanza/Bonanza Mines, Contact Lake Mines	File Numbers: S17L8-002
Date Prepared: June 24, 2022	Date of Board Meeting: September 22, 2022
Subject/Project Name: Great Bear Lake Sites – 2021 Annual Water Licence Staff Information Report	

1.0 Purpose

The purpose of this Report is to present to the Sahtu Land and Water Board (Board) for information on the public review completed for the **Great Bear Lake Sites 2021 Water Licence Report** required by licence S17L8-002.

2.0 Background

Licence	Report Received Date	Report Distributed (ORS)	Distribution List	Review Comments Due Date	Proponent Response Due Date	Public Review Comments (Y/N)
S17L8-002	March 31, 2022	May 5, 2022	SLWB – Deline District (JG)	June 24, 2022	July 1, 2022	Yes

3.0 Discussion

3.1 Project Overview – S17L8-002 – Miscellaneous Water Licence – Great Bear Lake Sites

In accordance with the requirements of the Water Licence S17L8-002 (the licence) Part B, condition 15, Crown-Indigenous Relations and Northern Affairs Canada – Contaminants and Remediation Division (licensee) has submitted the 2021 Annual Water Licence Report. Although formal Board approval is not required under the Licence, the Board must be satisfied that the Licensee has met the requirements of the Licence.

The licence entitles the use of water and waste deposition in support of remediation and restoration activities at the Great Bear Lake Sites, including the Silver Bear Mines, Contact Lake Mine, El Bonanza/Bonanza Mine, and the Sawmill Bay Site.

3.2 Summary of Major Activities Undertaken During The 2021 Reporting Period

It should be noted that the licence was issued to support upcoming remediation activities at the above locations. During the 2021 period the sites remained in pre-remediation status and no site remediation has occurred.

3.3 2021 Project Activities Schedule

July 14-16, 2021

Site Wide Hazard Assessment

- Hazard inventory/log of Smallwood Mine, Graham Vein, Norex, Northrim Mine, and El Bonanza.

August 13-24, 2021

Site Care and Maintenance Activities

- Inspection and/or services of select site vehicles and buildings
- Inspection of fuel cache
- Camp start up and close out
- Repair and servicing of select site vehicles and buildings
- Site resources inventory
- General site inspection

Gap Assessment at Silverbear, El Bonanza, Contact Lake, and Sawmill Bay sites

- Archaeological Impact Assessment (additional work Sept 22-24)
- Dock Bathymetry and Constructability Assessment
- Assess Terra Mine Fine Ore Bin
- Hazard materials Assessment
- Borrow source assessment
- Remediation Design Detail Confirmation

Water Quality Monitoring

- The 2021 Water Quality Monitoring Program was conducted as per the Board approved GBL Sites Pre-Remediation Monitoring Plan (PRMP), dated June 28, 2018,. Requirements of the PRMP were outlined within the renewed Project Water Licence S17L8-002 (“Admin Amend” version dated October 30, 2017)
 - Associated report is amended.

September 26-29, 2021

Site Tours

- Camp operated for 3 days by Sahtu De
- Walking tours of contact Lake Mine, El Bonanza Mine, Sawmill Bay, Northrim Mine, Norex, and Graham Vein

3.4 Water Use and Waste

Approximately 29.5m³ of water was obtained from the Camsell River and represents the total fresh water use for the 2021 period.

A total of 29.5m³ of liquid waste (camp wastewater) was deposited into a septic tank at Terra Mine.

3.5 2021 Engagement Activities

February:

- a) Meeting between the licensee and the Déljñę Got'jñę Government (DGG) to finalize terms of the Great Bear Lake Mine Remediation Governance Agreement. The Governance Agreement was finalized and signed Feb 23, 2021. The Government also formed the Remediation Management Committee, as well as the Operations Committee. Committees under the Governance Agreement have representatives from both CIRNAC and the DGG.

March:

- a) Meeting between the licensee and the DGG's Advisory Committee.

April:

- a) Meeting with DGG Special Council.

July:

- a) Introductory Meeting of the Remediation Management Committee and the Operations Committee to discuss terms of the committees.

August:

- a) Meeting between the licensee, DGG Special Council, and Operations Committee, along with participation in the annual Déljñę Spiritual Gathering.

September:

- a) Committee Site Tours – Aerial and walking tours of all sites within the project group.

November:

- a) GBL Operations Committee Meeting.

December:

- a) GBL Operations Committee Meeting.
- b) Community Town Hall Meeting.

3.6 Engagement Planned for 2022

- a) Engagement Meetings, Canada Déljñę Operations Committee, Community site tour, training program related to the upcoming remediation work at the GBL project site.

- b) The Community Liaison Coordinator and/or Construction manager position will continue to be funded in Délįnę through a contribution agreement that assists in planning engagement meetings and communicating with community members about the project.
- c) Additional training opportunities will be provided during the 2022 related to the Water Quality Monitoring Program, Hazmat abatement, the continued gap analysis/care and maintenance programs as well as in preparation for the remediation implementation.
- d) Project updates will continue being provided to the Waste Sites Management Committee when they meet.
- e) Project updates will be provided to the Tłıchǵ Government according to the approved Engagement Plan (currently planned April 2022).

4.0 Water Quality Monitoring

4.1 Principal Findings

All parameters at background stations met applicable Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (CWQG-PAL) guidelines, except for fluoride in R-2 and R-3 which the licensee attributes to regionally high concentrations of fluorine containing minerals.

Terra Mine

1. Fluoride concentrations in T-8 Ho Hum Tailings Containment Area (TCA) were approximately 5x higher than Camsell River background levels, but within historical ranges.
2. Arsenic and copper concentrations in T-8 exceeded Canadian Water Quality Guidelines for the Protection of Aquatic Life (CWQG-PAL).
3. Iron and aluminum concentrations were 10x higher compared to 2020, and exceeded the CWQG-PAL, but below the water licence Effluent Quality Criteria (EQC) for aluminum.
4. Long-term water quality data (2002-2021) indicated that arsenic concentrations in the Ho-Hum TCA decreased over time.

Northrim Mine

1. Copper and arsenic concentrations at NO-7 in Hermandy Lake marginally exceeded CWQG-PAL guidelines due to TCA submerged tailings.
2. Fluoride concentrations at NO-6 were marginally above CWQG-PAL but were within Silver Bear Mine regional background ranges.
3. Water quality at NO-06 is consistent with Camsell River background ranges.

Norex Mine

1. Fluoride concentrations in NX-3 reached 50% lower than numbers reported in 2020 and in range with those reported in 2017 to 2019.
2. Total arsenic concentrations at NX-3 exceeded the CWQG-PAL and was approximately 10-20 times higher than concentrations reported in 2020.
3. Total aluminum, total cadmium, total selenium, and dissolved zinc concentrations at NX-3 increased in 2021 compared to 2020 results, and exceeded the CWQG-PAL.
4. Sulphate concentrations at NX-3 were slightly higher in 2021 to 2016-2020.

Contact Lake

1. Fluoride concentrations in tailings pond CL-3 exceeded the CWQG-PAL but demonstrate a decreasing trend since 2017.
2. Total arsenic, copper and uranium concentrations in tailings pond CL-3 were consistently above the CWQG-PAL guidelines and generally one to two orders of magnitude higher than Contact Lake background ranges.
3. Tailings pond CL-3 reported detectable RA-226 concentrations but within its historic range.
4. Metal concentrations in CL-26 were generally stable and consistent with the background conditions.

Smallwood Mine

1. The 2021 dissolved zinc concentration at SM-1 reduced from 62.3 µg/L to 21.2 µg/L and is marginally higher than the calculated CWQG-PAL guideline of 16.0 µg/L.
2. Total zinc concentrations in the nearshore (SM-2), and off-shore (SM-6A and SM-6B) in Smallwood Lake were lower than samples collected closest to the waste pile (SM-1), but consistently higher than background conditions.
3. The elevated level of total zinc in the Smallwood Lake sample locations (SM-1, SM-2 and SM-6) should be investigated further in relation to recent geochemistry results, for the waste rock pile.
4. Responsive water monitoring should be continued in 2022 to confirm the increasing trend of metals and support the review of remedial design for waste rock.

5.0 Public Review

During the initial public review of the Great Bear Lake Sites 2021 Annual Water Licence Report a comment period extension was requested by Environment and Climate Change Canada (ECCC). The request was approved extending the reviewer comment period from May 13, 2022, to June 24, 2022, and proponent responses from May 20, 2022, to July 1, 2022.

Comments were received by ECCC and Government of Northwest Territories – Environment and Natural Resources – Environmental Assessment and Monitoring (GNWT-ENR-EAM).

GNWT-ENR-EAM:

ENR recommends that Crown-Indigenous Relations and Northern Affairs Canada – Contaminants and Remediation Division revise Section m) of the Report to indicate that the Great Bear Lake Sites 2021 Water Quality Monitoring Report is provided as Appendix A rather than Appendix C.

CIRNAC-CARD agreed and corrected the appendix reference in section M, and resubmitted the report.

ECCC:

ECCC recommended an investigation of historical climate data to determine if precipitation patterns influence metal concentrations at SNP station NX-3 as suspected by the Proponent. ECCC also

recommended that elevated metal concentrations continue to be evaluated with responsive sampling at other stations as required (i.e., NX-12, receiving environment).

CIRNAC-CARD

agreed that a historical climate investigation would be advantageous to further contextualize some of the non-typical results and installed an on-site weather station at Terra Mine in 2020 with the goal to be able to identify if site-specific climate factors are influencing water quality. Responsive sampling will continue, as per the approved Pre-Construction/Remediation Monitoring Plan.

6.0 Conclusion and Recommendation

Based on review of all evidence, the Licensee has met the requirements for the 2021 Annual Water Licencing Report of Licence S17L8-002.

Board staff recommend that the Board:

- Receive the Great Bear Lake Sites 2021 Annual Water Licence Report for information, noting that the Board is satisfied the licensee has met the requirements of the licence.
- Endorse/Support the draft letter to be sent by Board staff to the licensee indicating Board satisfaction with the 2021 Annual Water Licence Report and the recommendation(s) made by ECCC and GNWT-ENR-EAM.

7.0 Attachments

- 7.1 Board Staff Letter Indicating Satisfaction**
- 7.2 GNWT-ENR-EAM Comment Cover Letter**
- 7.3 ECCC Comment Cover Letter**
- 7.4 Review Comment Table**
- 7.5 Map of SNP Stations**

Respectfully submitted,



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