



Sahtu Land and Water Board

Staff Report

Division: Water Program	Report No.: 5
Date Prepared: July 12, 2018	File No.: S15L8-001
Meeting Date: July 20 2018	
Subject: INAC-Contaminants and Remediation Division (CARD) – Great Bear Lake Sites 2016 Water Quality Monitoring Data Report	

1. Purpose/Report Summary

The purpose of this Report is to present to the Sahtu Land and Water Board for consideration:

- a) Revised 2016 Water Quality Monitoring Data Report; and
- b) Summary of stakeholder review comments and Proponent responses.

2. Background

- **July 24, 2015** – S15L8-001 issued to INAC-Contaminants and Remediation Directorate (CARD) with 2 year term expiring July 23, 2017.
- **June 29, 2017** – 2016 Water Quality Monitoring Data Report (version 1.0) submitted to the Board (referred to as 2016 Water Quality Monitoring Report (2016 WQMR))
- **July 13, 2017** - The Sahtu Land & Water Board (SLWB or Board) approved a seven-year Type B Water Licence (S17L8-002) for remediation and restoration of the abandoned historic industrial properties of the Great Bear Lake Mine Sites;
- **September 11, 2017** – Board granted interim approval of the 2016 WQMR and required submission of a revised report in accordance with Board direction, the comments made during the related review and with emphasis on presenting the 2016 results.
- **May 7, 2018** - The Board received the revised Great Bear Lake Sites 2016 Water Quality Monitoring Data Report;
- **May 15, 2018** - Review packages were sent out electronically to members of the Deline Distribution List using the Online Review System with a request for comments by June 12, 2018;
- **June 12, 2018** – Reviewer comments received and deadline;
- **June 26, 2018** - Proponent response deadline and received;
- **July 20, 2018** - Presentation to the Board for decision.

3. Discussion

3.1 Project Overview

Through the issuances of past Water Licences S09L8-001 and S15L8-001, INAC-CARD has committed to monitor the aquatic environment in and around the abandoned mine sites as part of a comprehensive Water Quality Monitoring Program. The seven (7) sites have been identified as

1. Sawmill Bay
2. Contact Lake
3. El Bonanza; and Bonanza
4. Silver Bear Mines consisting of four (4) separate sites:
 - Terra
 - Northrim
 - Norex/Graham Vein
 - Smallwood

Monitoring will be used to determine whether the remedial strategies implemented have been successful and allow INAC-CARD to make modifications to ensure that the environment is being protected. INAC-CARD had proposed that in 2015/16, they would undertake a desktop review of all water quality monitoring studies from Great Bear Lake Sites dating back to 2002. Upon completion of the review, CARD would submit a revised Water Quality Monitoring Program which would include a schedule for pre-remediation monitoring, updated monitoring requirements for Sawmill Bay and would identify sites for inclusion into the Surveillance Network Program. The revised plan would be submitted to the Board upon completion. This submission became a requirement (condition) of the issuance of the renewal Water Licence for S09L8-001 (S15L8-002): specifically Part E, condition 1:

Within 180 days of the effective date of this Licence, the Licensee shall submit a Water Quality Monitoring Plan to the Board for approval. The Plan shall include, but not be limited to, the following information:

- a) A summary of all Great Bear Lake Remediation Program water quality monitoring results to date;
- b) A schedule for pre-remediation (Baseline) monitoring;
- c) Updated Construction Phase monitoring requirements;
- d) Recommended sites for inclusion into the Surveillance Network Program; and
- e) Updated Post-Construction Monitoring Plan.

The 2016 Water Quality Monitoring Report (WQMR) was received by the Board on June 29, 2017 and circulated for review on July 18, 2017. This 2016 WQMR presents the results of the 2016 field program and laboratory analysis in the context of available historical water quality data and appropriate guidelines (i.e. CCME). Specifically, this report draws attention to 2016 water quality data that indicates elevated concentrations; and data that approaches or exceeds applicable guidelines. It also provides a summary of previous monitoring programs undertaken at each site location. This report has for the first time, compiled available historical and current (2016) water quality data to allow for trend analyses to be undertaken over several years of data. The report also provides recommendations for future monitoring program (i.e. pre-Remediation, Construction and post-Construction) and is intended to meet the requirements for a Water Quality Monitoring Plan (WQMP) under S15L8-001. Overall, this report addresses INAC – CARD’s commitment to monitor the aquatic environment in and around these sites as part of Water Licence S15L8-001.

The approach taken to include the 2016 monitoring results in the WQMP is a deviation from previous submissions where these results have been included as part of the Annual Summer Site Inspection and/or Water Quality Monitoring Plan details required for the Annual Water Licence Report. Although the inclusion of these results in the WQMP met the requirements under S15L8-001, it also complicated the presentation of information.

While the WQMR was under review, the renewal Licence for S15L8-001 was approved on July 13, 2017, and the new Licence S17L8-002 carried forward conditions relating to the Water Quality Monitoring Program (Part D, condition 9):

Within 60 days of following issuance of this Licence, the Licensee shall submit to the Board for approval, a Water Quality Monitoring Plan. This Plan shall address all water quality monitoring including pre-Remediation, Construction, and post-Construction monitoring plans. The Plan shall meet the objectives listed in Part D, item 1 and be in accordance with Schedule 2, item 3.

INAC-CARD and Board Staff agreed that the 2016 WQMR submitted to fulfill conditions for Water Licence S15L8-001 would not meet the increased scope for the WQMP required by Water Licence S17L8-002. An approach to address deficiencies and recommendations received by the Board during the review process for the WQMR was discussed during a teleconference on Aug 18, 2017 and proposed to the Board on September 1, 2017. Board staff supported the request made by CARD and recommended the Board initiate an amendment to Part D and Schedule 2 of S17L8-002 to require submission of a Pre-Construction/Baseline Monitoring Report, Construction Monitoring Plan, Post-Construction Monitoring Plan and Long-Term Monitoring Plan which will align the water monitoring reporting requirements with recent Type B WLs issued to CARD in other regions of the NT for remediation projects.

Proponent responses on the 2016 WQMR were received August 29, 2017 and, in nearly all instances, CARD accepted the recommendations made by reviewers. CARD also included responses that proposed change in the deliverable approach. For example, CARD had responded to Comment ID ECCC 4; which recommended a method to improve trend analysis, that:

“...There are several typographic errors identified by technical reviewers which will be revised in the 2016 report. However, this recommendation will require large-scale amendment to the 2016 report. This level of effort in data analysis was considered questionable given 2017 monitoring results will be available within the month, making the 2016 report no longer current. SLWB staff was consulted to determine an appropriate approach. Consensus was reached that large-scale revisions to the 2016 report data do not provide forward looking improvements and may not be justified. Instead recommendation will be that the SLWB direct INAC CARD to incorporate changes into the 2017 Monitoring Report”.

On September 11, 2017 the Board approved the 2016 WQMR as the Interim 2016 Water Quality Monitoring Report and required submission of a revised report in accordance with Board direction and the comments made during the related review.

3.2 Process Requirements

Indigenous and Northern Affairs Canada (INAC) - Contaminants and Remediation Division (CARD) has submitted Great Bear Lake Sites 2016 Revised Water Quality Monitoring Report (WQMR) for Water Licence S15L8-001 (now S17L8-002). The revised report is being submitted in response to SLWB letter dated September 11, 2017 that granted interim approval of the 2016 WQMR (submitted under WL S15L8-001) and required subsequent revisions be made in accordance with comments made during the review with consideration that emphasis should be on presenting the 2016 results.

This Plan was required by Licence S15L8-001 Part E, condition 1:

Within 180 days of the effective date of this Licence, the Licensee shall submit a Water Quality Monitoring Plan to the Board for approval. The Plan shall include, but not be limited to, the following information:

- a) A summary of all Great Bear Lake Remediation Program water quality monitoring results to date;
- b) A schedule for pre-remediation (Baseline) monitoring;
- c) Updated Construction Phase monitoring requirements;
- d) Recommended sites for inclusion into the Surveillance Network Program; and
- e) Updated Post-Construction Monitoring Plan.

The requirement for Part E, item 1d was met during the regulatory process for the WL renewal and recommended SNP locations were included in the S17L8- 002 application cover letter and Annex for the issued Water Licence.

4. Comments

Board Staff received the revised WQMR with a cover letter indicating it was being submitted as a requirement of Water Licence S17L8-002. It was circulated for review under this Licence number. However, Board Staff note that this revised report is actually still a requirement of Licence S15L8-001.

5. Other Agency Comments

The 2016 WQMR was distributed to members of the current SLWB Deline Distribution List which includes 29 review organizations, requesting a reply by June 25, 2018. Of the 29 organizations to which the plans were distributed, 9 are represented within the Sahtu Settlement Area. Review comments were received from:

- Environment and Climate Change Canada (ECCC)
- GNWT – Department of Environment and Natural Resources (ENR);
- Sahtu Renewable Resources Board (SRRB)

A summary of comments are provided below. For complete comments and responses, please see Review Comments Table in Attachment 1

ECCC (ID1) - ECCC is generally satisfied with INAC-CARD's responses to comments and concerns raised by ECCC regarding the initial version of the 2016 Water Quality Monitoring Report, and with the commitment to incorporate the broader recommendations in future monitoring reports.

GNWT-ENR (ID1) – In their comments on Version 1 of the plan, ENR recommended that INAC CARD assess any implications of the 2016 results as they related to trend analysis and if there were any issues moving forward in understanding site conditions over time. In their response, it was noted that INAC CARD will incorporate this recommendation into the 2017 Monitoring Report. ENR will provide comments on the 2017 Monitoring Report upon its submission.

INAC-CARD responded that the 2017 Monitoring Report was provided to the SLWB in March 2018 as part of the Annual Water Licence Report (Appendix C), due to the presence of Surveillance Network Protocol (SNP) stations in the monitoring campaign. It is noted that INAC was requested by the SLWB to provide results of 2017 monitoring as a "data report", while trend analysis is to be incorporated in the forthcoming Baseline Water Quality Monitoring Report, as required in Water Licence S17L8-002 Part D, Item 10 (due six months prior to the start of remediation).

GNWT-ENR (ID2) - ENR requests clarification on the timing of development of an adaptive management framework as it relates to the updated Water Licence including requirements for monitoring plans at different phases of the project.

INAC-CARD responded that the requirement for Adaptive Management is set out in Schedule D, Part D, Item 4 (S17L8-002) for the Construction Monitoring Plan due 90 days prior to the commencement of remediation. In the current pre-remediation stage, there have been no earthworks or site alterations to date which could be expected to alter the receiving environment or aquatic conditions and require an adaptive management framework. Nevertheless, INAC has committed to conduct increased sampling should ongoing monitoring indicate rising contaminant concentrations or emerging concerns.

GNWT-ENR (ID3 and 4) – comments were made about Contact Lake Radionuclides and Trend Analysis on the first WQMR submission and INAC-CARD had noted that the ENR recommendation will be incorporated into the 2017 Monitoring Report and Water Quality Monitoring Plan requirements. ENR noted that they will review subsequent submissions as they relate to these topics, when available.

GNWT-ENR (ID6) - ENR requests that INAC CARD clarify the submission date and Water Licence requirements related to the “2017 Monitoring Report” referenced in their responses.

INAC-CARD responded that this report was included as part of the Annual Water Licence Report (Appendix C), for S17L8-002 due to the inclusion of SNP stations in the monitoring campaign.

SRRB (ID1) - include results of site specific risk assessments that place the 2016 data in context of the site remediation goals. Water monitoring data could be supported by the analysis of other media (e.g., sediment and soil) for better integration of local conditions.

INAC-CARD responded that they agree with the reviewers suggested inclusion of sampling other media and it is INAC's intention to do so during the Post-Construction phases.

SRRB (ID2) - Provide objectives of the water sampling program in the early sections of the report. Express the objectives in terms of site cleanup guidelines or site risk assessments. Sampling adit water probably doesn't make sense except as a source of contamination for local surface water. The report should also provide a performance target for QA/QC of chemical analysis (90% of analyses within QA targets).

INAC-CARD responded that they will: present the objectives of the water sampling program within the preliminary sections of the report; that site cleanup guidelines will be refined and included as part of subsequent monitoring plans (e.g. Construction/Remediation Monitoring Plan and Post-Construction Monitoring Plan); monitoring adit water stations will be removed in future monitoring campaigns; clarification will be added that comparisons of CCME AFW guidelines for metals and water quality and drinking water guidelines for radioactivity were used to highlight elevated concentrations and not to indicate in-situ risk to aquatic receptors; include the addition of performance targets for QA/QC parameters in the report revisions.

SRRB (ID4) - The analytes should go into a table, preferably with detection limits of the analysis.

INAC-CARD responded that a table of analytes with detection limits will be added to the report.

SRRB (ID5) - reference to add to the list: *SENES Consultants. June 2010. 2009 Baseline Monitoring Program.*

INAC-CARD responded that they will add the reference to the revised report.

SRRB (ID6) – please add more details for “elevated concentrations of some metals in the surface water on site”

INAC-CARD responded that additional discussion will be added to clarify the nature of elevated metal concentrations.

SRRB (ID7) - Provide justification for drinking water standards in this case. (Is there a radiation exposure/risk model for Contact Lake which is more appropriate?).

INAC-CARD responded that drinking water standards were applied as a screening tool only, which will be clarified in the report.

SRRB (ID8) - Consider ceasing analysing samples for dissolved metal, as the data often aren’t reproducible and CCME guidelines are expressed as total metal.

INAC-CARD responded that they made commitments to conduct dissolved metal analysis at SNP stations to address specific questions by Environment Canada during review of the Draft Water Licence. Where not required under this commitment, INAC will evaluate a reduction/removal of dissolved metal sampling in the future.

SRRB (ID9) - Total ammonia high in one sample, but not the duplicate. Please provide rationale for accepting the data of the sample and not discarding the data as inaccurate or an outlier.

INAC-CARD responded that this uncertainty will be clarified in the report. During the 2017 sampling program, there were no ammonia exceedances at this location.

SRRB (ID10) - Discuss the possibility of acid generation (at Northrim Mine) in terms of water sampling and whether it affects the water chemistry results through time.

INAC-CARD responded with detailed information and noted that this information will be clarified in the report as well.

SRRB (ID11) - Please specify when RPD conditions apply (only when analytes are 5x the DL?). Specify the number of analytes included in the calculation.

INAC-CARD responded that discussion of the RPD conditions and when applicable will be added to the report, as well as the number of analytes.

SRRB (ID12) - Please provide a brief analysis of data on the percent dissolved relative to total for the 2016 program.

INAC-CARD responded that a brief discussion will be added summarizing the general relationship between dissolved and total metal concentrations with respect to QA/QC samples. Further analysis on the 2016 samples will be completed in the Baseline Data Report.

Many of the SRRB comments and recommendations (ID 2, 4, 5, 6, 7, 9, 10, 11, 12) will be addressed by INAC-CARD through revisions to the report.

6. Conclusion

Reviewers were generally satisfied that their comments on the previous version of the report and this revised report were adequately addressed; however, there was still some confusion about this report in the context of future monitoring reports required by the new Water Licence S17L8-002. This confusion arose due to this report attempting to satisfy a Water Licence condition for S15L8-001 that has now been amended into a new requirement of the Water Licence S17L8-002 for completing a Baseline Monitoring Report prior to beginning remediation activities and for submitting annual water quality monitoring data as a stand alone report as required by the Annual Water Licence Report. The future Baseline Monitoring Report will compile all historic and current water quality data and develop a trend analysis. This 2016 report was a first attempt at undertaking this type of analysis. It was agreed that major revisions to this report would not be required and that revisions should focus on presenting the 2016 data. Some additional revisions are required to address reviewer comments and recommendations.

7. Recommendation

Board staff recommend that the Board:

- Approve the 2016 Water Quality Monitoring Report upon receipt of a revised Plan within 30 days of this approval that incorporates the changes as requested by reviewers and agreed to by CARD during this review. The 2016 Water Quality Monitoring Report will be considered approved, conditionally upon receipt of this information and written conformity of confirmation from Board staff.

8. Attachments

- 8.1 Review Comment Table
- 8.2 Draft Approval Letter

Respectfully submitted,



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Regulatory Specialist