



Sahtu Land and Water Board

Staff Report

Division: Water Program	Report No.: 5
Date Prepared: June 28, 2018	File No.: S17L8-002
Meeting Date: July 3 2018	
Subject: DIAND-Contaminants and Remediation Division (CARD) – Great Bear Lake Sites Pre-remediation Water Quality Monitoring Plan	

1. Purpose/Report Summary

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

- Pre-remediation Water Quality Monitoring Plan; and
- Summary of stakeholder review comments and Proponent responses.

2. Background

- 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;
- October 30, 2017** – The SLWB approved amendments to S17L8-002, Schedule 2 and Part D, to require submission of a Pre-Construction/Remediation Monitoring Plan, Baseline Water Quality Monitoring Report, Construction/Remediation 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;
- June 8, 2018** - The Board received the Great Bear Lake Sites Pre-remediation Water Quality Monitoring Plan;
- June 11, 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 25, 2018;
- June 25, 2018** – Reviewer comments received and deadline;
- June 28, 2018** - Proponent response deadline and received;
- July 3, 2018** - Presentation to the Board for decision.

3. Discussion

3.1 Project Overview

DIAND has the responsibility to manage a number of contaminated sites that are no longer maintained by the original occupant. The abandoned GBL Sites are amongst these legacy properties. Under the Contaminated Sites Management Program (CSMP), the DIAND Contaminants and Remediation Division (CARD) aims to restore and remediate the GBL Sites to their original state as much as possible to provide a net positive effect to land and water systems, improve environmental conditions and reduce environmental/safety risks.

The project refers collectively to the remediation activities required at the abandoned historic industrial properties of Silver Bear Mines (made up of Terra, Northrim, Norex, Graham Vein and Smallwood mine sites), El Bonanza and Bonanza Mine, Contact Lake Mine and Sawmill Bay site. The GBL Sites are located on or adjacent to the eastern shore of Great Bear Lake, within the Sahtu Region of the Northwest Territories. The nearest community to the Project site is Deline. The sites are within 60 km of one another and have therefore been consolidated for the purposes of monitoring and remediation. While the properties are remote and none are accessible by public or private roadway, they may be reached by rotary wing, fixed wing (floats at all sites or wheels at the abandoned airstrips at Terra Mine and Sawmill Bay) or by barge/boat.

The GBL Sites have been the subject of numerous assessments and studies to characterize the nature of environmental contamination and physical hazards. INAC's efforts to date have included Site Assessments, Hazardous Material Surveys, Risk Assessments and focused geochemical studies to name a few. Water quality monitoring has been conducted over multiple years, the results of which were relied upon to help determine the nature of site contamination, the impacts to the receiving environment and the requirements for site remediation. Efforts culminated in the production of Remedial Action Plans (RAPs) for each of the project sites, which summarized site conditions, interpreted results of sampling/assessment, evaluated remedial options and presented the selected remedial approach based on technical input and community consultations.

Remediation of the GBL Sites was first initiated as the Phase I Remediation Project completed in 2010-2011 and continued in 2016. Efforts focused on drum consolidation and removal, product consolidation/removal, building destruction) and debris consolidation. While these efforts have reduced site risks, there have been no earthworks or other site alterations to date which could be expected to substantially alter the receiving environment or aquatic conditions. Remaining work activities to complete the remediation as outlined in the RAPs will be completed as the GBL Sites Phase II Remediation Project, tentatively scheduled to require approximately five years. This will include completion of earthworks at Contact Lake Mine, El Bonanza/Bonanza Mine and Sawmill Bay, as well as the comprehensive remediation of the Silver Bear Mines.

In anticipation of the coming Phase II Remediation Project at the GBL Sites, INAC obtained the applicable regulatory authorizations through the Sahtu Land and Water Board (SLWB). This included an updated Water Licence (S17L8-002) taking effect on July 25, 2017. The Water Licence outlines the requirements of the site-specific Surveillance Network Program (SNP), including monitoring stations, analytical parameters and sampling frequency. The location and parameters of the SNP stations were selected based on future remedial activities which have the potential for effects (e.g. landfills, material processing), and also at areas of known impacts to water quality, such as tailings storage areas and waste rock seepage points. To further understand water quality changes in these areas, the SNP Program also includes downstream stations in receiving waters. The design of the SNP Program makes these stations the most appropriate and conservative locations to monitor site conditions during pre-remediation.

Water Licence S17L8-002 ("Admin Amend" version dated October 30, 2017) presents a staged monitoring approach to be applied before, during and after site remediation. The monitoring activities will be described in the monitoring plans/reports as stipulated in the Water Licence as follows:

- **Pre-Remediation Monitoring Plan:** The focus of the current report which is to be implemented prior to initiating Phase II remedial activities. This Plan will include an outline of sampling locations, methodology, and analytical testing parameters with Quality Assurance and Quality Control (QA/QC) measures. The general format of this plan is to be a concise and practical document that serves as a field guide when implementing the program.
- **Baseline Water Quality Monitoring Report:** To be submitted six months prior to the commencement of Phase II remediation and include a summary of all pre-remediation water quality monitoring results with statistical analysis to determine the ability to detect changes in water chemistry during remediation.
- **Remediation Monitoring Plan:** To be submitted 90 days prior to the commencement of remediation and detail the specific monitoring approaches tailored to assess environmental concerns from remedial activities (as listed in Water Licence S17L8-002 Schedule 2, Item 4). This monitoring phase will be more robust than pre-remediation in both the number of samples and frequency of collection and will also include an adaptive management framework.
- **Post-Remediation Monitoring Plan:** To be submitted 90 days prior to demobilization, the Post-Remediation Monitoring Plan will present the monitoring approaches to be applied in the years immediately following site remediation (as listed in Water Licence S17L8- 002 Schedule 2, Item 5) and include an adaptive management framework.
- **Long-Term Monitoring Plan:** Due six months prior to the cessation of the Post-Remediation Monitoring Plan, the Long-Term Monitoring Plan will describe the monitoring approaches to be applied to assess the performance of site remediation and the environmental conditions at the GBL Sites.

Monitoring activities will build upon results of previous stages, allowing monitoring to be increased or decreased based on the presence/absence of concerns.

In the absence of any remedial activities which may have changed site conditions since assessment, the Pre-Remediation Monitoring Plan (PRMP) is specific to water quality monitoring in and around the project sites. However, subsequent monitoring phases may include additional environmental media including sediment, groundwater, tailings/waste rock, etc.

During the pre-remediation stage there are no active waste discharges or similar site activities. Nonetheless, INAC has committed to perform annual monitoring at SNP stations where there is passive drainage (e.g. waste rock seepage, tailings ponds) as well as the SNP stations in the downstream aquatic receiving environments. The remaining SNP stations are not applicable as the associated activities have not yet taken place (e.g. landfarms, processing facilities). A complete listing of the pre-remediation sampling stations is provided in Table 2 within Section 3.7 of the PRMP.

Based on the predecessor documents, regulatory considerations and the pre-remediation status of the GBL sites, the following general monitoring objectives have formed the basis of the PRMP:

- Meet the requirements of the Water Licence Surveillance Network Program (SNP) at the project sites, including compliance with the most recent Quality Assurance and Quality Control Plan (INAC-CARD 2018);
- Respond to any anomalous data with increased sampling; and,
- Provide data which may be synthesized with previous findings to understand any trends in water quality.

It is important to note that pre-remediation monitoring is confirmatory in nature and not an attempt to generate additional assessment data for site characterization. All pre-remediation monitoring data will be incorporated with previous monitoring data and evaluated as part of the forthcoming Baseline Water Quality Monitoring Report.

The PRMP includes the scope of monitoring to be conducted until active site remediation begins. Water quality monitoring to date has determined that Contaminants of Concern (COCs) have generally remained stable in the receiving environment at the GBL Sites. Notwithstanding this consideration, INAC proposes to conduct annual pre-remediation monitoring. A consolidated single monitoring campaign will be conducted each year in the open-water season. Depending on logistical considerations (e.g., weather and availability of community support) sampling is anticipated to occur between July 15th and September 15th. This period aligns with the majority of prior assessment/sampling campaigns and will therefore facilitate inter-year analysis.

INAC has indicated that the project is on hold until funding and approvals can be obtained, and as such, the PRMP would be implemented annually, potentially over the next three open water seasons or until remediation begins.

3.2 Process Requirements

DIAND-CARD submitted Version 1.0 of its [Pre-Remediation Water Quality Monitoring Plan](#) on June 8, 2018 for Board approval. This Plan is required by Licence S17L8-002 Part D, condition 9:

Within 60 days following issuance of this Licence, the Licensee shall submit to the Board for approval, a PreConstruction/Remediation Monitoring Plan. This Plan will include an outline of sampling locations, methodology, and analytical testing parameters with QA/QC. The Licensee shall not commence PreRemediation Monitoring until the Board has approved the Plan. The Licensee shall act in accordance with the Plan once approved.

4. Comments

The PRMP approach includes Timing and Frequency, Access and Field Approach, Field Data and Observations, Sample Collection, Laboratory Analysis (including general chemistry, metals, petroleum hydrocarbons, radionuclides, SNP protocol parameters), Quality Assurance/Quality Control (both sampling and laboratory), Sampling Stations, and Reporting Requirements. One of the reviewers noted that “Overall, the report is clear, well-written and well organized”.

5. Other Agency Comments

The PRMP 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)
- SLWB – Sahtu Land and Water Board

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

ECCC (ID1) - ECCC recommends potentially adding a water quality sampling station to Smallwood Lake near the area of the waste rock pile if necessary. INAC agreed with the reviewers observations and intends to include Smallwood Lake stations in the “Responsive Sampling” as discussed in Section 2.3 of the Pre-Remediation Monitoring Plan

GNWT-ENR (ID 1 to 3) – had questions related to timing of sampling, on-land water stations and stratification. In a June 19, 2018 response from INAC to ENR, the questions related to these three topics were adequately addressed and ENR has no further questions or comments.

SRRB (ID1 and 2) - CARD and SLWB should consider whether the expense of the PRMP is necessary in terms of the already established remediation goals. If the SNP is continuing, it should be adequate. INAC concurred with the reviewer’s comments but noted “The PRMP incorporates the requirements of the SNP Program without modification. In addition, INAC has added a small number of reference stations to capture potential regional changes. The PRMP also incorporates QA/QC samples required as part of the GBL Sites QA/QC Plan, and meets the regulatory requirements as specified in Water Licence S17L8-002.

SRRB (ID4) - Check INAC's Northern Transportation Route report (1977) for water quality data to add to Table 2 of previous studies. INAC will add this reference to the report if appropriate.

SRRB (ID6) – sought clarification in the report that refers to “effects” – were these to water quality or to the biological community (e.g., benthos)?. INAC will clarify the statement on page 7 to indicate effects to downstream receiving environment refers to water quality only.

SRRB (ID7) – requested that use of the word “hypothesis” be replace with “assumption”. INAC agreed to revise the text on page 7 to replace “hypothesis” with “assumption”.

SRRB (ID13) - Please provide performance standards for the QC of the samples, and follow-up actions of QA/QC is not up to a standard. INAC will add a section to the PRMP to identify the performance standards and potential follow-up actions.

SLWB (ID1) - please consider updating the Plan to verify that data collected under these activities will be included in the preparation of the pending Baseline Report. INAC will clarify in the PRMP that all data collected as part of the PRMP will be incorporated in the pending Baseline Monitoring Report.

The comments noted above from SRRB and SLWB require some minor revisions to the report which INAC has agreed to complete.

Other comments received were technical in nature and in general, INAC agreed with the reviewer’s comments and provided detailed responses to clarify and expand on the rationale behind the methodology and analysis of water quality data and in some cases noting that more details would be included in the Baseline Monitoring Report or the Construction Monitoring Reports to be submitted at a later date.

6. Conclusion

The general format of this plan is clear and concise and meets the objective of a practical document that will serve as a field guide when implementing the program.

7. Recommendation

Board staff recommend that the Board:

- Approve the Great Bear Lake Sites Pre-remediation Water Quality Monitoring Plan Version 1.0 upon receipt of a revised Plan within 10 days of this approval that incorporates the changes as requested by reviewers and agreed to by CARD during this review. The PRMP 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,

A handwritten signature in black ink, appearing to read "Bonnie Bergsma", with a long horizontal flourish extending to the right.

Bonnie Bergsma
Regulatory Specialist