Government of the Northwest Territories
Closing Arguments

For

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CROWN-INDIGENOUS RELATIONS AND NORTHERN AFFAIRS CANADA – CONTAMINANTS AND REMEDIATION DIVISION
RAYROCK REMEDIATION PROJECT
TYPE A WATER LICENCE APPLICATION
W2020L8-0003

Submitted to:

Wek' èezhìi Land and Water Board
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July 2, 2021

TABLE OF CONTENTS

1.0 Introduction 4
2.0 Sherman Lake Water as Diluent 4
3.0 Confined Disposal Facility Location 4
4.0 Effluent Quality Criteria 5
4.1 Mill Lake Water Treatment Discharge 5
4.1.1 EQC for TPH and TSS 5
4.1.2 Maximum Average Concentration 6
4.1.3 Zinc EQC 6
4.2 Treated Sewage Discharge to a Sump 7
5.0 Water Quality Monitoring 7
5.1 Surveillance Network Program Sampling Frequency 7
5.2 Surface Water Runoff Control and Monitoring 8
5.3 Aquatic Effects Monitoring Program Required 9
6.0 Geochemical Characterization of Bedrock 9
7.0 Sediment and Erosion Control Plan 10
7.1 TSS Response Framework 10
7.2 TSS versus Turbidity Curve 10
7.3 Total Metals Water Quality Sampling during Sedimentation Events 11
8.0 In-Water Construction 12
9.0 Closure Criteria 12
10.0 References: 13

List of Acronyms

Aquatic Effects Monitoring Program	AEMP
Coliform Forming Units	CFU
Confined Disposal Facility	CDF
Crown–Indigenous Relations and Northern Affairs Canada	CIRNAC
Dissolved Organic Carbon	DOC
Effluent Quality Criteria	EQC
Government of the Northwest Territories	GNWT
Information Request	IR
Maximum Average Concentration	MAC
Maximum Grab Concentration	MGC
Mackenzie Valley Land and Water Board	MVLWB
Potentially Acid-Generating	PAG
Surveillance Network Program	SNP
Sediment and Erosion Control Plan	SECP
Total Dissolved Solids	TDS
Total Petroleum Hydrocarbons	TPH
Total Suspended Solids	TSS
Wek'èezhìi Land and Water Board	WLWB

1.0 Introduction

This closing submission outlines the Government of the Northwest Territories' (GNWT) concerns and recommendations regarding the proposed Crown–Indigenous Relations and Northern Affairs Canada (CIRNAC) Rayrock Remediation Project Type A Water Licence Application W2020L8-0003.

These recommendations are provided for the Wek'èezhìi Land and Water Board's (WLWB) consideration. This submission takes into consideration all of the documents provided up to May 14, 2021 including the Water Licence Application; information provided through Information Requests (IRs); Undertakings and discussions at the January 26-28, 2021 Technical Session; and the April 28- 30, 2021 Public Hearing.

Note several of the GNWT's recommendations from our Technical Intervention have been resolved. However, where required, based on the additional information available following the submission of the GNWT's Technical Intervention, amended recommendations have been included for clarity and accuracy purposes. The GNWT appreciates the opportunity to express its concerns and provide recommendations and suggestions to the WLWB on this licence application.

2.0 Sherman Lake Water as Diluent

The GNWT notes that in their comments on the Draft Water Licence, CIRNAC included a comment requesting that "water treatment diluent" ctaube added to the scope of the Licence (Part A, Condition 1b). The comment goes on to describe that CIRNAC "may need to withdraw water from Sherman Lake as diluent (or make-up water) of the Mill Lake sediments if the sediment-water ratio needs adjustment."

The GNWT notes that the use of Sherman Lake water as a diluent was not previously discussed during this Water Licence process. The GNWT does not support the use of freshwater for the purposes of dilution.

The GNWT recommends that Sherman Lake not be approved for use as a diluent.

3.0 Confined Disposal Facility Location

Throughout the Water Licence process, the GNWT indicated concern over the lack of information provided on the location of the Confined Disposal Facility (CDF). CIRNAC provided a location during their presentation at the Public Hearing and the GNWT committed to reviewing this information for the Closing Arguments.

With the location provided during the Public Hearing, as well as the conditions included in the Draft Water Licence, two of the GNWT recommendations on this topic have been resolved, while one recommendation is maintained.

The GNWT has reviewed the proposed location for the CDF and does not have any immediate concerns. The Draft Water Licence also contains a condition requiring the Licensee to "submit to the Board, for approval the Confined Disposal Facility Design and Construction Plan. The Plan shall be in accordance with the requirements of Schedule 3, Condition 1. The Licensee shall not commence Construction of the Engineered Structure prior to Board approval of the Plan."

The GNWT notes that the requirements of Schedule 3, Condition 1 include many important details for review, including the location of the CDF. The GNWT commits to reviewing the Confined Disposal Facility Design and Construction Plan once submitted and providing more detailed comments during review of that plan following licence issuance.

With the inclusion of Part E, Condition 6 in the Draft Water Licence, as well as the requirements under Schedule 3, Condition 1, the GNWT considers recommendations #1 and #3 of the intervention, to be resolved.

The GNWT notes that CIRNAC has not yet provided mitigations and control measures that will be implemented in the event of delays with CDF construction following the dewatering and treatment of Mill Lake water. This is a concern as a delay could result in extended exposure of the Mill Lake sediments, and potential erosion and transport of these sediments into Mill Creek and Sherman Lake.

The GNWT recommends that mitigation measures are in place in the event that any delays in CDF construction should occur.

As such, the GNWT maintains recommendation #2 of our intervention:

2. **The GNWT recommends that CIRNAC identify mitigations and control measures that will be implemented in the event of delays with CDF construction following the dewatering and treatment of Mill Lake water. These could be provided in the Sediment and Erosion Control Plan.**

4.0 Effluent Quality Criteria

This section outlines the GNWT recommendations on Effluent Quality Criteria (EQC) of Mill Lake treatment discharge, and treated sewage discharge.

4.1 Mill Lake Water Treatment Discharge

4.1.1 EQC for TPH and TSS

In our intervention, the GNWT recommended that EQC for Total Suspended Solids (TSS) and Total Petroleum Hydrocarbons (TPH) be added to the list of EQC proposed by CIRNAC in response to IR #12. The GNWT recommended a maximum average

concentration (MAC) of 15 mg/L and maximum grab concentration (MGC) of 25 mg/L for TSS, and a MGC of 5 mg/L for TPH.

In their response to interventions, as well as in response to the GNWT comments on the Draft Water Licence, CIRNAC indicated that they were agreeable to the TSS limits proposed by the GNWT, but disagreed with the TPH EQC.

Regarding TPH, CIRNAC noted that a spill contingency plan would be in place negating the need for TPH as an EQC. As stated during our presentation at the Public Hearing, the GNWT supports the implementation of a spill contingency plan, however, sampling of TPH is still a requirement at operational and remediation industrial sites to ensure mitigations are functioning as appropriate, and that petroleum hydrocarbons are not entering the receiving environment.

The GNWT maintains recommendation #4 regarding Mill Lake water treatment discharge EQC:

4. **The GNWT recommends that EQC for TSS and TPH be added to the list of EQC proposed in response to IR #12. The GNWT recommends an MAC of 15 mg/L and an MGC of 25 mg/L for TSS, and a MGC of 5 mg/L for TPH.**

4.1.2 Maximum Average Concentration

The GNWT was initially concerned with the absence of proposed MAC EQC, as MGCs are typically developed such that they are allowable for a short period of time and are not designed to regulate constant discharge to the receiving environment.

In their response to interventions, CIRNAC provided additional information regarding their position on the proposed EQC being MGCs. The GNWT now understands that these values were discussed with the Tłı̨chǫ Government and that in essence, MAC values will be applied as maximum grab concentrations, which will be more conservative from an environmental protection perspective.

As such, the GNWT considers recommendations #5 and #6 to be resolved.

4.1.3 Zinc EQC

In our intervention, the GNWT outlined reasons illustrating that a more conservative EQC for zinc would be the minimum calculated guideline for Sherman Lake of 15 µg/L.

In their response to interventions, CIRNAC provided additional rationale for their request for 23 µg/L for zinc based on their value developed using pH, hardness, and dissolved organic carbon (DOC) in Sherman Lake.

Based on this additional information, the GNWT is supportive of the zinc limit proposed by CIRNAC.

Therefore, recommendation #7 has been resolved.

4.2 Treated Sewage Discharge to a Sump

The GNWT's intervention included recommendations for revisions to the EQC values for treated sewage. In their response to interventions, CIRNAC provided additional rationale for the proposed EQC, citing other remediation sites with the same EQC.

The GNWT supports the proposed EQC for treated sewage, and therefore considers recommendations #8, #9, and #10 to be resolved.

5.0 Water Quality Monitoring

5.1 Surveillance Network Program Sampling Frequency

In review comments on the initial application, the GNWT recommended that several SNP stations have an increased sampling frequency to every two weeks to better monitor any potential changes to the receiving environment during remediation activities. This was further discussed at the Technical Session and the Public Hearing where the GNWT reiterated their recommendations.

In response to IR #13, CIRNAC provided an update to the proposed SNP. The GNWT notes that the sampling frequencies for SNP stations SNP 1663-1 to SNP 1663-6 and SNP 1663-8 had not been updated from the original proposed frequency of monthly during open water.

The GNWT notes that CIRNAC also proposed two additional SNP stations in their response to IR #13 (1663-10 and 1663-11). The GNWT supported the addition of these two stations in our intervention, and recommended that sampling occur every two weeks at SNP 1663-10 as recommended above for 1663-1 to 1663-6 and 1663-8. The GNWT notes that CIRNAC could seek to reduce monitoring frequency at a later date, with sufficient rationale following a period of sampling every two weeks.

As stated in our intervention, the GNWT supports the proposed weekly sampling frequency for Camp Wastewater if discharge were to continue beyond a week.

The GNWT also supports the revised sampling frequency for SNP 1663-9 New Control Lake A to monthly during open water for background water quality for regional trends.

The GNWT reviewed, and submitted comments on the SNP proposed with the Draft Water Licence. The GNWT supports the sampling frequencies listed in the Draft Water Licence and maintains the following recommendation:

11. The GNWT recommends that the sampling frequency for SNP stations 1663-1 through to 1663-6, 1663-8 and 1663-10 occur once every two weeks during open water.

5.2 Surface Water Runoff Control and Monitoring

Prior to discussions at the Public Hearing, the GNWT was concerned that precipitation and runoff events during remediation activities may lead to contaminated water entering the receiving environment. Any direct or indirect discharges to the receiving environment must meet the appropriate EQC.

At the Public Hearing, CIRNAC clarified that all surface runoff to the Mill Lake Drainage Basin will be captured and treated prior to discharge up until remediation activities have been completed. This clarification resolved the GNWT recommendation #12.

In their response to interventions, CIRNAC stated that “After all impacted sediments have been contained within the CDF, the Mill Lake drainage basin needs to be modified to prevent the lake re-forming.” During this phase, surface runoff will be directed to Mill Creek and in their response to interventions, CIRNAC identified that “sedimentation will be an issue…” CIRNAC indicated that to address this concern, sediment control measures will remain in place until vegetation is in place in Mill Creek to properly filter out the suspended sediments.

The GNWT maintains the position that the SNP program should include monitoring at the Mill Creek outflow to ensure that the natural peat soils are attenuating metals concentrations, and sediments, as expected and that runoff water entering Sherman Lake meets EQC.

The GNWT also notes that the Sediment and Erosion Control Plan (SECP) should include a description of measures that will be in place to capture sediments remaining on the surface of the drained Mill Lake. This has not specifically been listed as a requirement of the SECP in Schedule 4, Part 2 of the Draft Water Licence.

CIRNAC’s response to IR #5 did not address part B of the IR. As such, management actions for seepage/runoff in the event of detected changes in the environment should be described in a management plan submitted for review post issuance of the Water Licence.

In the Draft Water Licence, the Board included seepage monitoring as part of the Quarry Management Plan. In the absence of a Surface Water Management Plan, the GNWT supports the inclusion of seepage monitoring in the Quarry Management Plan. CIRNAC, however, stated in their comments on the Draft Water Licence that “The Quarry Management Plan will not be discussing seepage monitoring as the rock quarries are to be built on (CDF Location) and will be free draining (Mill Creek outlet). Seepage (if any) will be monitored through water quality analysis at previously

established locations." The GNWT notes that it is not clear where CIRNAC intends to describe their seepage monitoring program.

Based on the noted discussions at the Public Hearing, the GNWT has revised this set of recommendations as follows:

> **13. The GNWT recommends the SNP program include a monitoring location at the Mill Creek outflow to monitor runoff entering Sherman Lake and ensure it meets EQC.**
>
> **14. The GNWT recommends that CIRNAC outline sediment and erosion control measures to capture suspended sediment that will remain in place following remediation activities, in the SECP.**

5.3 Aquatic Effects Monitoring Program Required

The GNWT notes that an Aquatic Effects Monitoring Program (AEMP) was not provided with the Water Licence Application for review. A draft AEMP was later submitted to the Board and provided to reviewers "For Information" on December 23, 2020. CIRNAC responded to several the GNWT review comments by strictly referencing draft content of the AEMP, however it is the GNWT's understanding that this document is not officially part of CIRNAC's application, and therefore has not been reviewed as such.

At the Technical Session, GNWT offered to meet with CIRNAC to discuss the AEMP and provide input on the draft document in advance of baseline sampling to be conducted this coming open water season (2021).

In their response to interventions, CIRNAC noted that if an "AEMP is not deemed necessary, it should not be subjected to a formal review."

The GNWT notes that the Board has included the requirement for an AEMP in the Draft Water Licence. The GNWT is supportive of this requirement and as such maintains the following recommendation with slightly revised wording:

> **15. The GNWT recommends that if the Board determines that an AEMP is required through a condition of the Water Licence, it be submitted to the Board post-issuance of the Water Licence for review and approval.**

6.0 Geochemical Characterization of Bedrock

In response to the GNWT review comments on CIRNAC's response to IR #21, CIRNAC stated that "Environmental analyses completed on bedrock samples collected to-date has not identified Potentially Acid Generating (PAG) rock. Additional bedrock sampling and analysis will occur in 2021 to confirm past findings."

The GNWT notes that the planned additional bedrock sampling should be described in the Quarry Management Plan.

Additionally, CIRNAC stated that “If identified, PAG rock would be used within the CDF footprint and capped with a synthetic liner and non-PAG rock.” Details on the management and disposal of any PAG material should also be described in the Quarry Management Plan.

In response to the GNWT’s intervention recommendation, CIRNAC did agree that the Quarry Management Plan would “include the geochemical criteria for defining PAG material.” However, CIRNAC did not address the aspect of a bedrock geochemistry monitoring plan included as part of this recommendation.

The GNWT is supportive of Schedule 4, items 3 e, and f of the Draft Water Licence which address our recommendations and therefore maintains recommendation #16:

> **16. The GNWT recommends that geochemical criteria for defining PAG material, as well as a bedrock geochemistry monitoring plan be outlined in the Quarry Management Plan, to be submitted post-issuance of the Water Licence for review and approval of the Board.**

7.0 Sediment and Erosion Control Plan

7.1 TSS Response Framework

In our intervention, the GNWT recommended that CIRNAC develop a general response framework for action level exceedances as part of the SECP. In their response to interventions, CIRNAC committed to requiring a general response framework as part of the SECP submitted by their contractor.

The GNWT notes that while “Details for dust monitoring action levels and responses” is a requirement of the SECP under Schedule 4, 2b of the Draft Water Licence, there is no requirement listed for action levels and responses for a sedimentation event. The GNWT therefore maintains recommendation #17:

> **17. The GNWT recommends that CIRNAC develop a general response framework for action level exceedances as part of the SECP.**

7.2 TSS versus Turbidity Curve

CIRNAC noted at the Technical Session that they intend to measure TSS with a field meter that can measure TSS in real time. The GNWT supports the use of new technologies and equipment but is not aware of the referenced TSS field meter and its functionality/calibration/maintenance requirements. Because of this, the GNWT supports CIRNAC developing a TSS/turbidity curve that can be used to convert field measured turbidity readings to TSS values as an alternative and backup.

In their response to interventions, CIRNAC notes that “the exact means by which the quantification (of TSS) is performed (such as with a TSS versus turbidity curve) is at the discretion of the Contractor.”

The GNWT notes that the Board included a requirement under Schedule 4, 2i for “Consideration of a site-specific Total Suspended Solids/turbidity curve, and if it is not developed, the rationale for why”.

The GNWT maintains the position that in the absence of real-time TSS measurements, and in the event of a malfunctioning TSS field meter, a site-specific TSS/turbidity curve is a reliable way of determining TSS, and detecting potential sedimentation events during construction and remediation activities.

The GNWT therefore maintains recommendation #18 as follows:

> **18. The GNWT supports the use of technologies that are available such as a field meter for TSS measurements, but also recommends that a site-specific TSS/turbidity curve be developed as a backup method of determining TSS in the event that the field meter malfunctions or becomes unreliable.**

7.3 Total Metals Water Quality Sampling during Sedimentation Events

At the Technical Session, the GNWT followed up on CIRNAC’s response to review comment GNWT-32, and asked if CIRNAC would be willing to sample for total metals in the event of a turbidity and/or TSS action level exceedance, signifying a sedimentation event. The GNWT also suggested that this sampling could be described in the response framework developed for the SECP.

CIRNAC noted that they would consider this when developing a response framework for the SECP. However, in their response to interventions, CIRNAC noted instead that sampling total metals should not be required in the event of a sedimentation event.

The GNWT maintains their position that total metals sampling should be conducted in the event of a sedimentation event in order to monitor any potential changes to water quality as a result of such an event. The GNWT commits to reviewing and commenting on the SECP and corresponding response framework where such sampling should be described.

For additional clarity, the GNWT has slightly revised the wording of recommendation #19:

19. The GNWT recommends that water quality sampling for total metals (parameters that have EQC) be conducted in the event of a turbidity and/or TSS action level exceedance.

8.0 In-Water Construction

In our intervention, the GNWT recommended that in-water construction be considered as part of this proceeding for the dock expansion work proposed by CIRNAC.

In response to interventions, CIRNAC acknowledged that dock expansion is considered in-water construction.

The GNWT notes that the Draft Water Licence includes dock expansion in the scope, and that a "description of potential impacts of the dock expansion and associated mitigations" is required as part of the SECP. The GNWT supports these inclusions in the Draft Water Licence, and therefore considers the GNWT recommendations #20 and #21 to be resolved.

9.0 Closure Criteria

The GNWT outlined in our intervention that several closure criteria presented in Table C1 of the Remedial Action Plan required additional refinement. The GNWT provided examples of criteria that were not measurable, as well as criteria that lacked a temporal component to identify when a closure criterion has met the closure objective, as recommended in the Closure Guidelines (MVLWB/AANDC, 2013). While the GNWT acknowledges that progress was made in CIRNAC's response to IR #8, further refinement is needed.

The GNWT maintains that due to the importance of closure criteria, as outlined in the Guidelines (MVLWB/AANDC, 2013), the closure criteria as proposed should not be approved.

The GNWT supports the requirement for a Closure and Reclamation Plan (Part I, Condition1.) in the Draft Water Licence, and therefore maintains recommendations #22 and #23 as follows:

22. The GNWT recommends that the Board not approve the closure criteria proposed in Table C1.

23. The GNWT recommends that the Board require closure criteria in Table C1 be resubmitted for public review and Board approval post-issuance of the Water Licence.

10.0 References:

MVLWB/AANDC. 2013. Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories. November, 2013.