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May 23, 2023

File: W2020L8-0003

Rasel Hossain,
Senior Manager
Crown-Indigenous Relations and Northern Affairs Canada
Contaminants and Remediation Division
P.O. Box 1500 4923-52nd St
Yellowknife, Northwest Territories, X1A 2R3

Sent by email

Dear Rasel,

Re: Quarry Management Plan, Version 1 – Approved with Revisions Required – Rayrock Remediation Project – Miscellaneous – Former Rayrock Mine, NT

The Wek'èezhì Land and Water Board (Board) met on May 18, 2023, and considered the Quarry Management Plan (QMP), Version 1,¹ submitted by Crown-Indigenous Relations and Northern Affairs Canada – Contaminants and Remediation Division (CIRNAC-CARD) on April 4, 2023, as required by Water Licence (Licence) W2020L8-0003.

The Board has decided to approve the Quarry Management Plan, Version 1 and requires submission of Version 1.1 to the Board. Version 1.1 is to include the revisions outlined in the attached Reasons for Decision and should be prepared in accordance with the Land and Water Board's *Document Submission Standards*.

As described in the attached Reasons for Decision, approval of Version 1.1 is required prior to the start of borrow material extraction activities.

The details of the Board's decision are set out in the attached Reasons for Decision.

¹ See WLWB Online Registry (www.wlwb.ca) for [Rayrock - Quarry Management Plan - Version 1 - Part 1 - Apr 5 23.pdf](#) and [Rayrock - Quarry Management Plan - Version 1 - Part 2 - Apr 5 23.pdf](#)

Please direct questions or concerns regarding this letter to Ryan Fequet in writing.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Mason Mantla', written in a cursive style.

Mason Mantla
Chair, Wek'èezhìi Land and Water Board

BCC'd to: Rayrock Distribution List
 Tim Morton – Inspector, CIRNAC

Attached: Reasons for Decision



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Reasons for Decision

Reference/File Number:	W2020L8-0003 (Type A Water Licence)
Licensee:	Crown-Indigenous Relations and Northern Affairs Canada – Contaminants and Remediation Division (CIRNAC-CARD)
Subject:	Quarry Management Plan (QMP), Version 1.0

Decision from the Wek'èezhì Land and Water Board Meeting of May 18, 2023

1.0 Decision

On May 18, 2023, the Wek'èezhì Land and Water Board (WLWB or the Board) considered Crown-Indigenous Relations and Northern Affairs Canada – Contaminants and Remediation Division's (CIRNAC-CARD) Quarry Management Plan (QMP), Version 1.0.² In consideration of the submission, reviewer comments, and proponent responses, the Board has decided the following:

1. To approve Version 1.0 of the QMP;
2. To require Version 1.1 of the QMP to include Revisions #1 to #4;
3. To require Version 1.1 of the QMP to be submitted 14 days prior to commencement of borrow material extraction activities;
4. To require approval of Version 1.1 prior to the start of borrow material extraction activities; and
5. To require CIRNAC-CARDS to submit the AECOM reports referenced in the QMP (i.e., the 2018, 2019, and 2020 reports), specifically the geochemical results included in those reports, with submission of Version 1.1 of the QMP.

² See WLWB Online Registry (www.wlwb.ca) for [Rayrock - Quarry Management Plan - Version 1 - Part 1 - Apr 5 23.pdf](#) and [Rayrock - Quarry Management Plan - Version 1 - Part 2 - Apr 5 23.pdf](#)

2.0 Background

Rayrock (Kwetı̀ꞑaà) is a former underground uranium mine located within Tłı̨chq̓ lands, approximately 60 km northeast of Whatı̀, Northwest Territories. Remediation of the Rayrock mine site requires quarrying and borrowing to generate construction materials. Where blasting of rock is required, these locations are called quarries. Where excavation of loose soils can occur, these locations are called borrows. The quarry sites include the Confined Disposal Facility (CDF), BA-03, and BA-04 (called Mill Lake outlet). The quarrying of materials from the CDF and Mill Lake outlet is also required to construct these areas to implement site remediation. The borrow sites include BA-01 and BA-02. In general, the QMP describes the locations where quarrying and borrowing of materials will take place, along with the management and monitoring associated with these activities, and the reclamation of the quarry and borrow sites after the materials are removed.

The QMP is required by Part E, Condition 8 of Water Licence W2020L8-0003 (the Licence);³ Schedule 4, Condition 3 outlines the information required in the QMP. Version 1.0 of the QMP was submitted to the Board on April 4, 2023. After a conformity evaluation by Board staff, Version 1.0 of the QMP was distributed for public review on April 6, 2023, inviting reviewers to provide comments and recommendations using the Online Review System (ORS). Comments and recommendations were received by the deadline of April 27, 2023, from the Wek'èezhì Renewable Resources Board (WRRB), Tłı̨chq̓ Government, Government of the Northwest Territories – Environment and Natural Resources (GNWT-ENR),⁴ Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), and Environment and Climate Change Canada (ECCC); Board staff also submitted questions. CIRNAC-CARD provided responses to reviewer comments by the deadline of May 2, 2023. The review summary is available on the ORS.⁵

With the May 2, 2023 response, CIRNAC-CARD proposed a change to the extent of the CDF quarry from that presented in the QMP and provided an updated map showing this change. The proposed change in quarry extent was to mitigate a potential health and safety concern and involves extending the south side of the CDF quarry to improve access with heavy equipment. The expansion of the CDF quarry will generate additional construction materials and CIRNAC-CARD identified that the BA-03 quarry may not need to be developed. The BA-03 quarry will remain an option for development should it be required, and therefore the only change to the QMP proposed on May 2, 2023 is an updated map that shows the new extent of the CDF quarry.

3.0 Reasons for Decision

The QMP was reviewed for conformity to Part E, Condition 8 and Schedule 4, Condition 3 of the Licence. All reviewer comments and CIRNAC-CARD's responses submitted during the public review period were also reviewed. With regards to the extension of the CDF Quarry, as proposed by CIRNAC-CARD on May 2,

³ See WLWB Online Registry (www.wlwb.ca) for [Rayrock – Licence – Jan 30 23.pdf](#)

⁴ The GNWT Departments of Lands, and Department of Environment and Natural Resources were amalgamated into the Department of Environment and Climate Change on April 1, 2023. For cohesion with the wording on the Online Review System (ORS), Government of the Northwest Territories – Environment and Natural Resources – Environmental Assessment and Monitoring (GNWT-ENR) was used throughout these Reasons for Decision.

⁵ See WLWB Online Review System (new.onlinereviewssystem.ca) for the [Quarry Management Plan – Version 1.0](#)

2023, the Board is of the opinion that the size of the extension is not a substantial change to the initially proposed quarry and the additional quarry activity at this location would not require any additional management from that already presented in Version 1.0 of the QMP. For these reasons, the Board believes that a public review of the extended CDF Quarry is not required and would otherwise increase the burden on reviewers and potentially cause project delays. As discussed below, most of the revisions for the QMP are administrative in nature or relate to providing clarifications; therefore, the Board has decided to approve Version 1.0 of the QMP and requires CIRNAC-CARD to submit Version 1.1 for conformity.

➤ ***Decision #1: The Board has approved Version 1.0 of the CDF Design Plan.***

➤ ***Decision #2: CIRNAC-CARD is to submit Version 1.1 of the QMP to include Revisions #1 and #4.***

The Board requires that the updated QMP (i.e., Version 1.1) be updated prior to commencement of quarry activities. While the Board is of the opinion that Version 1.1 does not need to be approved prior to the commencement of quarrying (i.e., rock blasting within the CDF Facility), it should be approved prior to the commencement of borrow material extraction. Specific to borrows, the geochemical monitoring program requires updates in the QMP (see Revisions 1 and 2 within Section 3.1 of these Reasons for Decision) to confirm the materials will not result in acid generation or metal leaching prior to extracting borrow materials.

To allow sufficient time for completion of a conformity evaluation, Version 1.1 of the QMP is to be submitted as soon as possible and at least 14 days prior to commencement of borrow material extraction activities.

➤ ***Decision #3: Version 1.1 of the QMP is to be submitted 14 days prior to commencement of borrow material extraction activities.***

➤ ***Decision #4: Approval of Version 1.1 is required prior to the start of borrow material extraction activities.***

3.1 Revisions to the QMP

Reviewer comments were received by several Parties and relevant information is summarized within the following topics:

- Topic 1 – Items pertaining to the geochemical monitoring and criteria associated with borrow materials.
- Topic 2 – Items CIRNAC-CARD provided for additional information or clarification in response to reviewer comments and, when incorporated into a revised version of the QMP, would provide additional clarity and certainty regarding the implementation of the QMP.
- Topic 3 – Items CIRNAC-CARD committed to incorporating into a revised version of the QMP.

- Topic 4 – Items CIRNAC-CARD provided for additional information or clarification in response to reviewer comments and an update to the QMP is not considered necessary because it would not provide additional certainty regarding the implementation of the QMP.

Topic 1

Schedule 4, Condition 3e of the Licence requires that a “[d]escription of geochemical characterization and testing including geochemical criteria for defining Potential Acid Generating material and metal leaching” be included in the QMP. WLWB staff (comments 2 and 3) requested additional information to understand the proposed geochemical monitoring that would occur during excavation of the borrow materials, as well as the geochemical criteria that would be applied to borrow materials. WLWB staff (comment 2) requested clarification on the geomechanical criteria to define potential acid generating material and metal leaching that would be applicable to the borrow materials. The QMP presented the geochemical criteria for the materials extracted from the quarries but did not present any geochemical criteria for materials extracted from the borrows. As described below, CIRNAC-CARD provided an overview of the geochemistry of the borrow material and were of the opinion that geochemical criteria for borrow materials are not necessary.

In response to WLWB staff (comments 2 and 3), CIRNAC-CARD informed that the borrow materials are “naturally deposited rocks, sand, and clays” and it was also identified that the former airstrip borrow “consists predominantly of a cohesive soil material”. CIRNAC-CARD is of the opinion that the borrow materials do not require any geochemical criteria because these materials have not been impacted by mine-related activities and because these materials typically do not have acid drainage or metal leaching concern because they have been deposited and exposed to the environment for “thousands of years”. CIRNAC-CARD informed that the:

...analysis of samples to date have shown naturally occurring chromium and nickel concentrations that are not mine derived [and] not a concern. Considering the extensive use of this material for cover throughout the Rayrock site, CIRNAC-CARD is of the opinion that the assessment of the borrow material is complete and additional sampling and testing for this material is not warranted.

The QMP referenced previous geochemical test results that were presented in the 2018, 2019, or 2020 AECOM reports; however, CIRNAC-CARD did not provide these reports in response to comments and these documents were not identified as being available on the public registry for review. Rather, CIRNAC-CARD identified a 2022 AECOM report as the document for the most recent geochemical testing results. The 2022 AECOM report had limited geochemical testing completed of the airstrip borrow location and included test results of only two bedrock samples, which are not cohesive soils or soils that are sand or clays that make up the soil types CIRNAC-CARD noted to be present in the borrow. A summary of the geochemical testing results from the 2020 AECOM report was provided in response to comments, but the information presented was limited to understanding if the testing completed to date has confirmed if the borrow material would not generate acid or leach metals if used in construction. To ensure that all Parties

have access to the available geochemical results for the site, the Board is requiring that the AECOM reports referenced in the QMP be submitted with Version 1.1 of the QMP.

- ***Decision #5: CIRNAC-CARD is to submit the AECOM reports referenced in the QMP (i.e., the 2018, 2019, and 2020 reports), specifically the geochemical results included in those reports, with submission of Version 1.1 of the QMP.***

While it may be reasonable to assume the potential for acid drainage or metal leaching is low due to the long-term environmental exposure of the borrow materials, especially for cohesive soils, this assumption has not been proven. The Board is of the opinion that confirmation that the materials are not acid generating or metal leaching is a reasonable precautionary approach for environmental protection. In the absence of supporting data, it cannot be determined if the borrow materials will generate acid or leach metals. Based on the limited geochemical testing results available, the Board is of the opinion that geochemical monitoring of the borrow materials should occur during extraction and that this geochemical monitoring of the borrow materials occur at the same frequency as defined for the quarry. This frequency of monitoring is considered representative of standard practices and guidelines and the quantity of samples that would require sampling over the duration of the reclamation program is considered by to be reasonable. Alternatively, if CIRNAC-CARD has existing data for the borrow source material that demonstrates it meets appropriate geochemical criteria (see Revision #2 below), this can be provided with Version 1.1 and CIRNAC-CARD can request, with rationale, discontinuing the geochemical testing of the borrow material. This request would be considered through the Board's standard public review process.

- ***Revision #1: Version 1.1 of the QMP is to be revised to include geochemical testing of the borrow materials at the same frequency as defined for the quarry. Alternatively, as part of Version 1.1, CIRNAC-CARD can request, with rationale, discontinuation of geochemical testing of the borrow material if it can provide data demonstrating that it meets appropriate geochemical criteria.***

As mentioned above, geochemical criteria for defining potential acid generating material and metal leaching is a requirement of Schedule 4, Condition 3e of the Licence. The QMP did not propose any geochemical criteria for the borrow materials with regards to defining if they have potential to generate acid or leach metals. The Board is of the opinion that the borrow materials require geochemical criteria to define if, and where, the materials are suitable for use in construction and that this information is required to satisfy the Licence condition. The Board is thus requiring that the geochemical criteria proposed for the quarry materials be applied for use as the geochemical criteria for the borrow materials. The reason for this is that reviewers accepted these geochemical criteria for use in the quarries and therefore, the Board believes it is reasonable to assume its application for the borrows would also be acceptable to reviewers. If CIRNAC-CARD is of the opinion that these geochemical criteria are not suitable for the borrow materials, alternative criteria can be proposed in Version 1.1 and considered through the Board's standard public review process.

- **Revision #2: Version 1.1 of the QMP is to be revised to include geochemical criteria of the borrow materials to be the same as defined for the quarry. Alternatively, as part of Version 1.1, CIRNAC-CARD can propose alternative criteria to be applied to borrow material.**

Topic 2

The Tłıchq Government, ECCC, GNWT-ENR, and WLWB staff provided comments to further understand the QMP. CIRNAC-CARD responded to these reviewer comments and the Board is of the opinion that the QMP should be updated to provide additional clarity and certainty regarding the implementation of the QMP. The Board has decided that the QMP is to be revised to address the following items (Topic 2: bullets i. to viii):

- i. Provide a cross-reference in the QMP to the section in the Site-Specific Health and Safety Plan (SSHASP) that documents the risk scenarios and risk measures associated with explosives management (CIRNAC comments 1 and 2);
- ii. Provide a cross-reference in the QMP to the section of the CDF Design Plan which contains the 2022 bedrock geochemistry report (WLWB staff comment 4);
- iii. Provide additional information regarding the borrow and quarry closure activities and closure criteria associated with water quality, slopes and geotechnical stability, and revegetation (WLWB staff comment 9);
- iv. Provide a statement in the QMP to inform that CIRNAC-CARD (and the contractor) commits to following the AECOM recommendations regarding assessment of rock geochemistry as listed in section 2.3 of the QMP (GNWT-ENR comments 4, 5, and 8; ECCC comment 2);
- v. Provide additional information that compares the proposed testing frequency for Acid Rock Drainage (ARD)/Metal Leaching (ML) to the GNWT Quarry Sampling and Testing Guidance for Identification of ARD/ML Potential (Tłıchq Government comments 5 and 15);
- vi. Provide a statement in the QMP that commits to including proposed borrow and rock as a source of potential contaminants of concern in the predictive water balance and water quality model for Sherman Lake, should a model of this type be determined to be required based on the evaluation of the project site monitoring results (Tłıchq Government comment 6);
- vii. Provide a trigger that would define when dry brushing of the rock would not be applied and when an alternative method would be applied to mitigate airborne dust (Tłıchq Government comment 7); and
- viii. Provide a commitment in the QMP to actively identify opportunities for progressive reclamation of the quarries and borrows and to implement progressive reclamation where reasonably practicable (Tłıchq Government comment 19).

- **Revision #3: Version 1.1 of the QMP is to be revised to address reviewer comments associated with Topic 2, bullets i. to viii. Version 1.1 is to include a concordance table to identify where the reviewer comment was addressed.**

Topic 3

The Tłıchq Government, ECCC, GNWT-ENR, and WLWB staff provided comments to further understand the QMP. In response to these reviewer comments, CIRNAC-CARD committed to updating the QMP with additional or revised information. The Board agrees and requires that the QMP be revised to address the following items (Topic 3: bullets i. to viii):

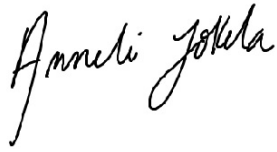
- i. Provide additional information regarding how water removed from the CDF quarry, BA-03 Quarry, and the Mill Lake Outlet Quarry will be managed (WLWB staff comments 6);
- ii. Provide the Canadian Council of Ministers of the Environment – Protection of Aquatic life (CCME-PAG) and Sherman Lake historical water quality concentrations that will be used to evaluate potential for metal leaching (WLWB staff comment 7);
- iii. Provide additional information regarding the use and extraction of quarry materials with high acid rock drainage or metal leaching classification (GNWT-ENR comment 7);
- iv. Clarify the contradictions in the QMP associated with water management (ECCC comment 3);
- v. Provide the correct cross-reference to Figure 1 as being in Appendix A (Tłıchq Government comment 3);
- vi. Update the QMP to remove the wording “if required” in reference to confirmation graduation testing because this item is addressed in the project specifications (Tłıchq Government comment 12);
- vii. Correct Figure 1 in the QMP with a site layout figure that includes the correct camp location (Tłıchq Government comment 18); and
- viii. Correct Figure 1 in the QMP with a site layout figure that depicts the revised CDF Quarry extents as presented in CIRNAC-CARD’s May 2, 2023 response to reviewer comments.

➤ ***Revision #4: Version 1.1 of the QMP is to address the reviewer comments associated with Topic 3, bullets i. to viii. Version 1.1 is to include a concordance table to identify where the reviewer comments were addressed.***

Topic 4

WLWB staff (comments 1, 8, and 10), GNWT-ENR (comments 2, 3, and 6), and Tłıchq Government (comments 2, 4, 8, 9, 10, 11, 13, 14, 16, and 17) provided several comments or recommendations for clarification to further understand the QMP. CIRNAC-CARD provided additional information to adequately address the review comments. The Board is of the opinion that CIRNAC-CARD’s responses to these review comments do not warrant an update to the QMP because it will not provide additional clarity or certainty regarding the implementation of the QMP.

Signed the 23rd day of May 2023, on behalf of the Wek'èezhìi Land and Water Board



Witness



Mason Mantla
Chair, Wek'èezhìi Land and Water Board