Water Resources Division
Resource Management Directorate
Nunavut Regional Office
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Your file - Votre référence
2AM-MEA1530, 2AM-WTP1830
Our file - Notre référence
GCDocs# 135298619

March 4, 2026

Richard Dwyer
Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU, X0B 1J0
E-mail: licensing@nwb-oen.ca

Re: Crown-Indigenous Relations and Northern Affairs Canada's Agnico Eagle Mines updated Interim Closure and Reclamation Plan (ICRP) for the Meadowbank Complex for Type A Water Licences 2AM-MEA1530 and 2AM-WTP1830

Dear Richard Dwyer,

Thank you for the 16 January 2025 invitation to review the updated Interim Closure and Reclamation Plan (ICRP) application, submitted by Agnico Eagle Mines (AEM), for Type A Water Licences No. 2AM-MEA1530 and 2AM-WTP1830.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) examined the application pursuant to its mandated responsibilities under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Crown-Indigenous Relations and Northern Affairs Act*. Please find CIRNAC comments and recommendations in the attached Technical Memorandum.

The applicant shall provide confirmation from the Nunavut Water Board that all outstanding water license fees have been paid in full prior to approval of this application.

If there are any questions or concerns, please contact William Quere at william.quere@rcaanc-cirnac.gc.ca Or Andrew Keim at (867) 975-4550 or Andrew.keim@rcaanc-cirnac.gc.ca.

Sincerely,

Quere, William
Digitally signed by Quere, William
Date: 2026.03.04 14:40:56 -06'00'

William Quere, BSc
Municipal Coordinator

Technical Review Memorandum

Date: 4 March 2026

To: Richard Dwyer – Manager of Licensing, Nunavut Water Board

From: William Quere – Municipal Coordinator, CIRNAC

Subject: **Crown-Indigenous Relations and Northern Affairs Canada's Agnico Eagle Mines updated Interim Closure and Reclamation Plan (ICRP) for the Meadowbank Complex for Type A Water Licences 2AM-MEA1530 and 2AM-WTP1830**

Region: ☐ Kitikmeot ☒ Kivalliq ☐ Qikiqtani

A. BACKGROUND

The Meadowbank Gold Mine is located approximately 110 kilometres by road north of Baker Lake in the Kivalliq region of Nunavut, Canada. The complex consists of the Meadowbank mine and mill and the Whale Tail (Amaruq) satellite deposit, which is located 50 kilometres northwest of the Meadowbank mine. Each site operates under a separate Type A Water Licence: 2AM-MEA1530 (Meadowbank) and 2AM-WTP1830 (Whale Tail).

The Nunavut Water Board (NWB, Board) first licensed the project in 2008, and the processing plant achieved commercial production in March 2010. The Project involved the construction, operation, maintenance, reclamation, closure and monitoring of an open pit gold mine and milling facility. The original licence was subsequently renewed by the Board in August 2015 and was amended in July 2018 to reflect changes to the Project to allow for additional tailings deposition and associated ore processing at the Meadowbank mine site from Agnico Eagle Mines (AEM) mining operations at the Whale Tail Pit site. No mining at Meadowbank mine occurred in recent years since the mineral reserves were exhausted in 2019.

In 2016, Agnico Eagle proposed to develop the Whale Tail Pit Project to continue mine operations and milling at the Meadowbank mine. Agnico Eagle initially requested that the Whale Tail Pit Project be regulated as an amendment to the Meadowbank Gold Mine Project. However, the Nunavut Impact Review Board (NIRB) determined that the proposed Whale Tail Pit Project proposal had not been assessed as part of the original Meadowbank Gold Mine Project and, due to its location outside of the original Meadowbank Gold Mine Project footprint, it would require a separate screening assessment. Upon completing the screening assessment, the NIRB determined that the Whale Tail Pit Project required further assessment, best facilitated through a full environmental review. The environmental review concluded on March 15, 2018, with Project Certificate No. 008 issuance.

Additional infrastructure to support the Whale Tail Pit Project was built at the Amaruq site (truck shop/warehouse, fuel storage and an additional camp facility), and the Amaruq satellite deposit was mined as an open pit with commercial production beginning in September 2019. Amaruq ore is transported using long-haul off-road type trucks to the mill at the Meadowbank site for processing. All tailings generated from Amaruq ore are also deposited at the Meadowbank site.

The Amaruq Phase 2 expansion started in October 2018 with an application to the Nunavut Planning Commission (NPC). Following public hearings on the proposed expansion in August 2019, the NIRB concluded that the proposed Whale Tail Pit Project amendment could proceed to the Type A Water License amendment phase with the Nunavut Water Board. The Minister of Northern Affairs approved the amended Project Certificate Report from the NIRB on January 20, 2020, completing the NIRB process. NIRB issued the Project Certificate 008 amendment No. 1 on February 19, 2020 to reflect significant modifications to the Whale Tail Pit Project as proposed in the Whale Tail Pit Expansion Project (i.e., revisions to Terms and Conditions #1, 27, 28, 30, 46 and 51; new Terms and Conditions #65 to 68).

As existing gold processing and accommodations infrastructure at the Meadowbank Gold Mine site are required to support mining operations at the Whale Tail Pit, NIRB identified existing terms and conditions in the amended Project Certificate No. 004 that will continue to apply to the Whale Tail Pit project infrastructure associated with the Meadowbank Gold Mine site, even after the closure and reclamation of the developed pits at the Meadowbank Gold Mine site.

In 2025, AEM submitted a combined Interim Closure and Reclamation Plan (ICRP) for the Meadowbank complex to include both Meadowbank mine and Whale Tail mine. The stated goal of combining the ICRP's is to "give Agnico Eagle flexibility in progressive reclamation, closure approaches, and closure scheduling". The new ICRP has included new information on closure activities and monitoring results. With the intent on entering closure in the coming years, AEM would like to update their reclamation liability. To this end, the ICRP includes a preferred final closure plan for the Meadowbank TSF.

CIRNAC provides the following comments and recommendations pertaining to the application package. A summary of the subjects of recommendations can be found in Table 1. Documents reviewed as part of this submission can be found in Table 2 of Section B. Detailed technical review comments can be found in Section C.

Table 1: Summary of Recommendations

Recommendation Number	Subject
R-01	Closure sequencing versus potential life-of-mine extension
R-02	Treatment of the TSF closure appendix as “final” prior to a Final Closure and Reclamation Plan (FCRP)
R-03	Aggressive review timelines
R-04	Engagement claims and incorporation of feedback
R-05	Revegetation strategy
R-06	Tracking of changes from previously approved closure concepts
R-07	Change to the approved Tailings Storage Facility (TSF) design basis
R-08	TSF closure strategy is not ready to be treated as “final”
R-09	Risk of advancing TSF closure ahead of integrated site-wide closure planning
R-10	Closure objectives and criteria are not measurable
R-11	No TSF-specific post-closure Trigger Action Response Plan (TARP)
R-12	Geotechnical risks of thicker covers are not demonstrated
R-13	Referenced supporting studies are not provided
R-14	No structured post-closure failure modes assessment
R-15	Cold-regions cover performance
R-16	Rationale for strategy change
R-17	Alternatives analysis (Multiple Accounts Analysis (MAA)/options screening)
R-18	Meromixis feasibility and verification
R-19	Meromixis failure modes and contingency planning
R-20	Freshwater cap depth and aquatic life protection
R-21	Regulatory acceptability of “dirty water at depth”
R-22	Pipeline transfer risk and mitigation
R-23	Portage/Goose pit re-flooding assumptions (tailings stability and water quality)
R-24	Cost and liability transparency
R-25	Early Implementation of Unapproved Water Management Strategy
R-26	Potential Requirement for Nunavut Impact Review Board (NIRB) Environmental Assessment Review
R-27	Post-closure water quality criteria are not clearly defined or differentiated
R-28	Lack of a structured Trigger Action Response Plan (TARP) and reconnection decision framework
R-29	Waste Rock Storage Facility (WRSF) wet-up and dynamic equilibrium may not be demonstrated
R-30	Sensitivity and uncertainty analysis is insufficiently developed
R-31	Role of in-pit tailings as a water quality source term is unclear
R-32	Reconnection timing is highly sensitive to arsenic predictions

R-33	Modelling horizon does not fully capture late-time source term evolution
R-34	Long-term recontamination risk from in-pit tailings
R-35	Removal of committed rock cover over in-pit tailings
R-36	Tailings resuspension and physical disturbance under flooded conditions
R-37	Regulatory and closure consistency of changing the in-pit tailings end state
R-38	Status and suitability of partially treated reclaim water
R-39	Rationale for abandoning the approved treatment-and-discharge strategy
R-40	Demonstration of in-pit treatment performance
R-41	Status and readiness of the closure water treatment system
R-42	Consistency with the approved ICRP
R-43	Basis for differing Waste Rock Storage Facility (WRSF) cover thicknesses (Meadowbank vs. Whale Tail)
R-44	Active layer penetration through the thermal covers
R-45	Availability and adequacy of detailed thermal modelling reports
R-46	Progressive reclamation verification
R-47	Consideration of non-geochemical closure factors (e.g., wildlife interaction)
R-48	Viability of contingency measures for underperforming thermal covers on WRSFs
R-49	Inconsistent modelling horizons between source terms and water quality predictions
R-50	Underground disposal of equipment, demolition debris, and contaminated soils
R-51	Cyanide-impacted residues and demolition considerations
R-52	Disposal pathways and acceptance criteria for demolition waste
R-53	Confirmation of residual acid rock drainage/metal leaching (ARD/ML) and metals exposure across disturbed footprints
R-54	Criteria for identifying “metal contamination” and adequacy of non-potentially acid generating/non-metal leaching (NPAG/NML) cover material
R-55	Exposure scenario assumptions in the HHERA
R-56	Apparent absence of soil POPCs despite widespread mine disturbance
R-57	Chromium in sediments at Third Portage Lake
R-58	Interim nature of Closure and Post-Closure Compliance Monitoring Plan (CPCMP) and Adaptive Reduction Framework
R-59	Technical justification for any monitoring reductions
R-60	Linkages to current operational/Water Licence monitoring
R-61	Adaptive Reduction Framework Decision Rules
R-62	Seepage monitoring needs explicit trigger-response linkages

R-63	Workshop to advance the monitoring/reduction framework
R-64	Proposed Interim Closure and Reclamation Plan (ICRP) scope changes
R-65	Security release framework
R-66	Evidence requirements to support security reduction
R-67	Escalation, inflation, and timing of security updates

B. DOCUMENTS REVIEWED AND REFERENCED

The following table (Table 2) provides a list of the documents reviewed under the submission and reference during the review.

Table 2: Documents Reviewed and Referenced

Document Title	Author, File No., Rev., Date
Interim Closure and Reclamation Plan for the Meadowbank Complex	Agnico Eagle, Version 1, December 2025
Appendix 1-A: Meadowbank Closure Consultation and Engagement Comments and Questions	AEM, April 2025
Appendix 2-A: Meadowbank and Whale Tail 2024 Geotechnical Inspection Report	AEM, February 2025
Appendix 5-A: Progressive Reclamation of Quarries	AEM, November 2024
Appendix 5-B: Progressive Reclamation Photographs	AEM, 2121, 2023, 2024
Appendix 6-A: Closure and Post-closure Monitoring Plan, V1	AEM, November 2025
Appendix 6-B: Reclamation Research	AEM, undated
Appendix 6-C: Closure Investigation Work Plan	AEM, October 2024
Appendix 6-D: Human Health and Ecologic Risk Assessment	WSP, October 2024
Appendix 6-E: Meadowbank Water Balance and Water Quality Model – Technical Report	Lorax, November 2024
Appendix 6-F: Technical Memorandum – Predictive Effects Assessment for Fish in the Pits at Meadowbank During Closure	Azmith, November 2024
Appendix 6-G: Acceptable/ Unacceptable Types of Waste for the Meadowbank Complex Landfill Including electronic (e-waste), tires and vehicles/machinery	AEM, October 2024
Appendix 6-H: Portage WRSF Cover Design and Thermal Monitoring	Okane, February 2023
Appendix 6-I: Whale Tail Adaptive Management Plan	AEM, July 2021

Document Title	Author, File No., Rev., Date
Appendix 6-J: Final Closure Design for North and South Cell Tailings Storage Facility	AEM, October 2025
Appendix 6J-A: Meadowbank TSF Closure Design Concept Summary	AEM, November 2025
Appendix 6J-B: Evidence-Based Selection for Tailings Storage Facility Cover Configuration	AEM, December 2025
Appendix 6J-B-A: Independent Review Board Letter of Recommendation	IRB, October 2025
Appendix 6J-B-B: Meadowbank TSF Cover Sensitivity Methods	Lorax, October 2025
Appendix 6J-B-C: Simple Thermal Modelling Methods	SLR, October 2025
Appendix 8-A: RECLAIM	AEM,
Appendix 9-A: Soil Quality Remediation Guidelines	WSP, October 2024

C. RESULTS OF REVIEW

1. Closure sequencing versus potential life-of-mine extension

Comment:

The Interim Closure and Reclamation Plan (ICRP) characterizes the Meadowbank Complex as approaching closure and the plan as "near-final," while AEM has publicly indicated it is evaluating options to continue operations beyond 2028. In this context, it is unclear why certain closure components (specifically the Tailings Storage Facility, TSF) are being advanced toward finalization and construction in 2026, given that continued operations could materially affect closure sequencing, integration, and design assumptions.

Recommendation:

(R-01) CIRNAC recommends that AEM should clearly document the rationale for advancing TSF closure at this stage, including explicit scenarios for closure in 2028 versus continued operation beyond 2028, and to explain how each scenario affects site-wide closure integration, water management, and long-term risk.

2. Treatment of the TSF closure appendix as "final" prior to a Final Closure and Reclamation Plan (FCRP)

Comment:

The ICRP states that the TSF closure strategy should be considered final and approved in advance of the full FCRP to enable construction in 2026, despite AEM not being prepared to submit a site-wide FCRP at this time. Given the strong interdependencies between the TSF, water management, monitoring, and contingencies, advancing a single major component as "final" introduces risk that assumptions embedded in the TSF design may later be affected by site-wide closure decisions (and vice versa).

Recommendation:

(R-02) CIRNAC recommends that AEM should explicitly justify the appropriateness of treating the TSF closure strategy as final in advance of the full FCRP, including a clear explanation as to how interdependencies with other closure components will be managed and revisited if site-wide assumptions change.

3. Aggressive review timelines

Comment:

Appendix 6J suggests that review and approval of the ICRP, including the TSF closure design, should not exceed 60 days, citing prior engagement with reviewers. Given the number of substantive information gaps and unresolved technical issues identified across

multiple components (as identified in this submission of review comments), this timeline is not consistent with the level of review required to support informed closure decisions.

Recommendation:
(R-03) CIRNAC recommends that AEM should remove any implied expectation of a fixed or accelerated approval timeline, and instead support a review process that is paced by the resolution of identified technical information gaps.

4. Engagement claims and incorporation of feedback

Comment:
AEM states that extensive engagement has been undertaken with communities, Inuit organizations, and regulators in support of closure planning (as documented in Appendix 1A). However, the ICRP does not clearly demonstrate how that input influenced or changed the closure plan. Without this traceability, it is difficult to assess whether engagement outcomes have been meaningfully incorporated.

Recommendation:
(R-04) CIRNAC recommends that AEM provide a summary table documenting engagement inputs, AEM responses, and specific changes made to the ICRP as a result of that input, including identification of any unresolved issues.

5. Revegetation strategy

Comment:
The ICRP states that active revegetation will be omitted from reclamation prescriptions, citing feasibility considerations and historical preferences for natural recovery. While this may be appropriate in some contexts, the submission does not clearly demonstrate that current Inuit leadership supports this approach for the Meadowbank Complex, nor does it define measurable expectations for natural recovery.

Recommendation:
(R-05) CIRNAC recommends that AEM should document current Inuit organization positions on the omission of active revegetation and to define clear, verifiable criteria for assessing the success of natural recovery post-closure.

6. Tracking of changes from previously approved closure concepts

Comment:
The ICRP includes several material departures from closure concepts that were previously reviewed or approved, including the TSF closure approach and pit water management strategy. These changes are not consolidated within a single, authoritative tracking

mechanism. This creates uncertainty around what has and has not been accepted for approval purposes.

Recommendation:
(R-06) CIRNAC recommends that AEM should include a comprehensive closure change log that identifies all departures from previously approved closure concepts, provides the rationale for each change, documents engagement undertaken, and identifies any regulatory implications. Any changes not included in this log should be treated as not yet approved.

7. Change to the approved Tailings Storage Facility (TSF) design basis

Comment:
The TSF closure concept presented within the Interim ICRP represents a change from the closure basis relied upon during original project approvals. Project Certificate No. 004 was issued with the expectation that tailings would remain frozen following closure. The revised concept accepts that thaw will extend through the proposed 2-m cover and into the tailings shortly after closure, with further deepening of thaw under future climate conditions, as shown in the thermal modelling in Appendix C to Appendix 6J-B.

Allowing post-closure thaw of tailings represents a material change in closure philosophy. This change alters the long-term assumptions regarding tailings geochemistry and containment. Based on technical discussions in 2025, the Kivalliq Inuit Association (KivIA) has expressed concern with allowing thaw penetration into the tailings. Proceeding with this approach without clear alignment of risks departing from expectations established during project approval.

Recommendation:
(R-07) CIRNAC recommends that AEM provide evidence that KivIA does not oppose the revised TSF closure approach and to evaluate whether additional mitigation measures are required to address long-term tailings thaw and stability prior to advancing closure construction.

8. TSF closure strategy is not ready to be treated as “final”

Comment:
The ICRP and Appendix 6J state that the TSF closure strategy should be considered final and approved in advance of the site-wide Final Closure and Reclamation Plan (FCRP), with construction proposed to begin in 2026. At the same time, Appendix 6J-A describes the TSF design as conceptual and notes that detailed design work remains outstanding.
Approving a final closure strategy at the conceptual design stage is premature. This limits the ability to respond to findings from detailed engineering, site-wide integration, or updated

performance assessments. For a facility of this scale, this approach introduces unnecessary risk.

Recommendation:
(R-08) CIRNAC recommends that AEM should treat TSF closure works as progressive reclamation only, with any approval explicitly conditional on the submission and approval of detailed engineering designs and recognition that the design may change as work advances.

9. Risk of advancing TSF closure ahead of integrated site-wide closure planning

Comment:
AEM is seeking approval of the TSF closure strategy ahead of a fully integrated site-wide closure plan. The TSF is strongly linked to other closure components, particularly long-term water management, seepage collection, monitoring requirements, and post-closure contingencies. Advancing TSF closure in isolation increases the risk that assumptions embedded in the TSF design will later conflict with site-wide closure requirements.

Recommendation:
(R-09) CIRNAC recommends that AEM should justify the need for early “approval” of the TSF closure strategy and to demonstrate that advancing TSF closure ahead of the full Closure and Reclamation Plan (CRP) will not constrain or increase risk to integrated site-wide closure decisions, particularly those related to water management.

10. Closure objectives and criteria are not measurable

Comment:
The TSF closure objectives presented in Table 1 of Appendix 6J are generally reasonable. However, the associated criteria are largely qualitative and not easily verifiable. Many criteria are framed in terms of design intent or modelled behaviour rather than measurable performance thresholds.

This makes it difficult to confirm closure success, interpret monitoring data, define triggers for corrective action, or support future security reduction. Given that all TSF seepage is routed to Collection Pond 23, water quality at that location is the primary performance metric and should be reflected directly in the criteria.

Recommendation:
(R-10) CIRNAC recommends that AEM revise the TSF closure criteria to include explicit, quantitative performance thresholds, including concentration-based water quality limits at Collection Pond 23, defined averaging periods, allowable exceedances, and measurable indicators of cover and physical performance.

11. No TSF-specific post-closure Trigger Action Response Plan (TARP)

Comment:
The TSF closure approach relies on long-term passive performance supported by monitoring. The ICRP does not define trigger thresholds or response actions if post-closure conditions deviate from expectations. For a facility of this size and consequence, reliance on monitoring without predefined responses is a gap in the closure strategy.

Recommendation:
(R-11) CIRNAC recommends that AEM develop a TSF-specific post-closure TARP that defines measurable triggers, response actions, and reporting requirements, with triggers tied directly to water quality at Collection Pond 23 and other key TSF performance indicators.

12. Geotechnical risks of thicker covers are not demonstrated

Comment:
The ICRP states that increasing the TSF cover thickness beyond 2 m would introduce geotechnical risks due to increased mass loading. The submission does not describe the relevant failure modes or quantify the associated risks. Without this information, the stated trade-off between thermal performance and geotechnical risk cannot be evaluated.

Recommendation:
(R-12) CIRNAC recommends that AEM identify and quantify the geotechnical failure modes associated with increased cover thickness and demonstrate how these risks compare to the proposed 2 m cover.

13. Referenced supporting studies are not provided

Comment:
Appendix 6J-A refers to test pitting, porewater chemistry, and the numerical modelling used to assess tailings saturation, oxidation state, and lateral flow behaviour. The underlying data and analyses are not included in the submission. These studies appear to be central to the justification of the closure design.

Recommendation:
(R-13) CIRNAC recommends that AEM submit the test pit logs, porewater chemistry results, and numerical modelling documentation referenced in Appendix 6J-A, with sufficient detail to allow for independent technical review.

14. No structured post-closure failure modes assessment

Comment:
The ICRP considers climate-related performance of the TSF cover but does not include a structured assessment of post-closure geotechnical and hydrotechnical failure modes. Climate change is only one source of risk. Other credible failure mechanisms include erosion, settlement, internal drainage changes, and long-term degradation of infrastructure.

Recommendation:
(R-14) CIRNAC recommends that AEM complete a post-closure Failure Modes and Effects Assessment for the TSF focused on geotechnical and hydrotechnical failure modes, with clear linkages to monitoring, TARPs, and mitigation measures.

15. Cold-regions cover performance

Comment:
The TSF isolation cover will operate in a cold-regions environment where ice lensing, frost heave, solifluction, and differential settlement can affect performance. The ICRP does not explicitly evaluate the design against these mechanisms. Reliance on general modelling and design intent is not sufficient to demonstrate long-term performance.

Recommendation:
(R-15) CIRNAC recommends that AEM evaluate the TSF cover design against the Cold Regions Cover System Design Technical Guidance Document (MEND, 2012), explicitly addressing known cold-regions failure mechanisms and their implications for long-term performance.

16. Rationale for strategy change

Comment:
The revised post-closure pit water management approach (i.e., pump to Vault versus treatment and discharge to Portage Lake) represents a material change from the concept evaluated at approval, but the submission does not clearly explain why the previously approved approach is no longer suitable or what specific deficiencies it had, if any.

Recommendation:
(R-16) CIRNAC recommends that AEM provide a structured rationale for the strategy change, including the technical basis for rejecting the prior approach and a clear statement of the new objectives and constraints driving the revision.

17. Alternatives analysis (Multiple Accounts Analysis (MAA)/options screening)

Comment:
The proposed pipeline transfer and permanent storage of partially treated water in Vault Pit appears to have been selected without a transparent, systematic comparison to feasible alternatives for managing pit reclaim water and achieving post-closure compliance.

Recommendation:
(R-17) CIRNAC recommends that AEM conduct a formal alternatives evaluation (MAA or equivalent) comparing credible water management concepts on environmental performance, long-term liability, constructability, operational risk, regulatory fit, and cost.

18. Meromixis feasibility and verification

Comment:
The revised strategy relies on long-term meromixis in the Vault Pit to isolate non-compliant water at depth, but the submission does not provide sufficient modelling or site-specific evidence to demonstrate that stable stratification will be maintained over the long term.

Recommendation:
(R-18) CIRNAC recommends that AEM perform quantitative modelling to demonstrate meromixis stability under realistic forcing conditions, including clear performance criteria and monitoring parameters that would confirm stratification is behaving as assumed.

19. Meromixis failure modes and contingency planning

Comment:
The submission does not present a credible failure-mode assessment for the loss of stratification (e.g., extreme storms, unusual thermal conditions, subaqueous slope failure, operational upsets) or describe what actions would be taken if meromixis weakens or fails.

Recommendation:
(R-19) CIRNAC recommends that AEM conduct a failure modes assessment specific to Vault Pit stratification and a contingency response plan (triggers, actions, equipment/logistics) for partial or full mixing scenarios.

20. Freshwater cap depth and aquatic life protection

Comment:
The basis for the proposed freshwater cap thickness (e.g., 15 m) is not clearly tied to protection of aquatic life or to predicted mixing and exposure pathways, particularly if partial mixing occurs.

Recommendation:
(R-20) CIRNAC recommends that AEM explicitly demonstrate that the freshwater cap depth is protective of aquatic life under expected and upset conditions, including how criteria will be evaluated pre- and post-connection to receiving waters.

21. Regulatory acceptability of "dirty water at depth"

Comment:
The strategy intentionally maintains non-compliant water in a flooded pit that is intended to become connected to aquatic habitat; however the submission does not demonstrate how this is consistent with applicable federal legislation and regulatory expectations.

Recommendation:
(R-21) CIRNAC recommends that AEM provide written confirmation (or documented engagement outcomes) from relevant federal regulators (e.g., Environment and Climate Change Canada (ECCC)/Fisheries and Oceans Canada (DFO), as applicable) commenting on the acceptability of the proposed approach as well as any conditions or constraints that would apply.

22. Pipeline transfer risk and mitigation

Comment:
Transferring partially treated contaminated water many kilometres by pipeline introduces new potential failure pathways (rupture/leak, valve failure, freezing, wildlife interactions, spill response limitations) that are not fully characterized in the submission.

Recommendation:
(R-22) CIRNAC recommends that AEM conduct a pipeline risk assessment and mitigation package, including credible rupture scenarios, spill consequence analysis, detection/automatic isolation, seasonal operability, and response planning appropriate for Nunavut's remote conditions.

23. Portage/Goose pit re-flooding assumptions (tailings stability and water quality)

Comment:
The revised plan still relies on re-flooded pits with in-pit tailings behaving predictably over the long term, but the submission does not clearly demonstrate how the proposed water cover depth will prevent tailings resuspension and protect long-term water quality.

Recommendation:
(R-23) CIRNAC recommends that AEM provide modelling and/or supporting evidence for (a) long-term water quality evolution in re-flooded pits with tailings, and (b) adequacy of

minimum water cover depths to prevent resuspension under expected hydrodynamic and ice-related conditions.

24. Cost and liability transparency

Comment:
The revised strategy likely shifts costs and risks across facilities and time (e.g., treatment duration, monitoring burden, potential long-term management), but the submission does not provide a clear comparison to the previously approved strategy.

Recommendation:
(R-24) CIRNAC recommends that AEM provide a comparative cost and liability assessment between the revised and prior strategies, including long-term monitoring, contingency actions, and implications for financial assurance.

25. Early Implementation of Unapproved Water Management Strategy

Comment:
AEM is proposing to begin transferring partially treated reclaim water to the Vault Pit in 2026, prior to approval of a revised site-wide closure and reclamation plan, despite this approach being inconsistent with the currently approved Interim Closure and Reclamation Plan (ICRP). Initiating permanent placement of non-compliant water in advance of regulatory approval introduces material regulatory and closure risks.

Recommendation:
(R-25) CIRNAC recommends that AEM formally acknowledge that permanent disposal of partially treated water in the Vault Pit has not yet been approved, and that any early transfers are undertaken at AEM's risk, with the understanding that alternative or previously approved closure approaches may ultimately be required.

26. Potential Requirement for Nunavut Impact Review Board (NIRB) Environmental Assessment Review

Comment:
The revised post-closure water management strategy represents a substantive departure from the water management concept that was assessed during the original environmental assessment for the Meadowbank Project. Given the scale of the change, the introduction of new risk pathways, and the long-term implications for pit lakes and receiving waters, it is unclear whether the revised approach has been adequately screened against NIRB referral criteria or whether additional public and regulatory review is warranted.

Recommendation:
(R-26) CIRNAC recommends that AEM provide a formal assessment as to whether the revised water management strategy triggers referral to NIRB under the NIRB process, including a clear rationale supporting its conclusions and documentation of any regulatory engagement supporting those conclusions.

27. Post-closure water quality criteria are not clearly defined or differentiated

Comment:
The ICRP relies on the existing Water Licence criteria to frame closure performance, but it is not clearly stated whether post-closure water quality objectives are intended to be identical to operational criteria or whether a different set of post-closure criteria will be applied. While use of licence criteria is common, the document does not clearly articulate how reduced site presence, reliance on passive systems, and long-term uncertainty are accounted for in post-closure decision-making.

Recommendation:
(R-27) CIRNAC recommends that AEM clearly state the post-closure water quality criteria, compliance points, and averaging periods that will govern pit reconnection and discharge decisions, and confirm whether these differ in any way from the current operational criteria and why.

28. Lack of a structured Trigger Action Response Plan (TARP) and reconnection decision framework

Comment:
The ICRP and Appendix 6E describe predicted timelines for pit reconnection but do not define a structured decision framework for how reconnection decisions will be made based on monitoring results. Given the number of parameters, seasonal variability, and uncertainty in long-term predictions, reconnection cannot reasonably be treated as a single-criterion or single-date decision.

Recommendation:
(R-28) CIRNAC recommends that AEM develop a post-closure water quality TARP that includes a decision tree for pit reconnection and Collection Pond 23 discharge, defining required parameters, trends, confirmation periods, and response actions if predictions are not met.

29. Waste Rock Storage Facility (WRSF) wet-up and dynamic equilibrium may not be demonstrated

Comment:
The long-term water quality predictions in the ICRP rely on WRSF seepage rates and chemistry that are implicitly assumed to be representative of long-term, post-closure conditions. However, waste rock storage facilities typically require extended periods to fully wet up, particularly under cold-region conditions where infiltration, internal drainage, and freeze–thaw processes can significantly delay the development of steady seepage pathways. If wet-up is incomplete within the modelling period, early-time seepage volumes and concentrations may systematically under-represent long-term chemical loadings and fluxes, which has direct implications for predicted pit lake water quality, reconnection timing, and post-closure discharge performance. This uncertainty is potentially significant because key closure decisions (e.g., pit reconnection and treatment cessation) are being tied to modelled outcomes that may precede true hydrologic and geochemical equilibrium in the WRSFs.

Recommendation:
(R-29) CIRNAC recommends that AEM explicitly demonstrate, using model outputs, that WRSF seepage has reached hydrologic and geochemical dynamic equilibrium within the simulation period, including clear criteria for how equilibrium is defined. Where equilibrium is not achieved, extend the modelling horizon or apply bounding cases to ensure that long-term seepage rates and water quality are conservatively represented in closure and reconnection decision-making.

30. Sensitivity and uncertainty analysis is insufficiently developed

Comment:
The post-closure water quality predictions presented in the ICRP and Appendix 6E are based on a series of critical assumptions related to source terms, hydrology, treatment performance, climate inputs, and mixing behaviour, many of which are subject to inherent uncertainty and natural variability. In several cases, predicted concentrations for key parameters are close to applicable criteria or are used to justify specific reconnection timelines, making the results particularly sensitive to relatively small changes in input assumptions. Without explicit sensitivity and uncertainty analyses, it is difficult to assess the robustness of the conclusions or to understand how deviations between predicted and observed conditions could affect closure outcomes and regulatory decisions.

Recommendation:
(R-30) CIRNAC recommends that AEM complete and document sensitivity and uncertainty analyses for the water quality and water balance models, focusing on key assumptions and drivers that influence predicted compliance and reconnection timing. The results should

clearly illustrate the range of plausible outcomes and identify which parameters and assumptions most strongly affect post-closure water quality performance, to better inform risk-based decision-making and contingency planning.

31. Role of in-pit tailings as a water quality source term is unclear

Comment:
The ICRP and Appendix 6E screen pit lake water quality against criteria at planned reconnection dates, but do not clearly describe how in-pit tailings are represented as long-term source terms in the modelling. Given their importance to turbidity, metals, and long-term water quality, this assumption should be explicit.

Recommendation:
(R-31) CIRNAC recommends that AEM clearly document how in-pit tailings are represented in the water quality model, including source term assumptions, resuspension or diffusion mechanisms, and sensitivity of predicted pit lake chemistry to those assumptions.

32. Reconnection timing is highly sensitive to arsenic predictions

Comment:
For Whale Tail in particular, arsenic appears to be the controlling parameter for reconnection timing, and concentrations are predicted to increase following flooding due to ongoing wall exposure. The ICRP does not clearly define the mitigations that will be considered if arsenic concentrations remain above predictions at the planned reconnection decision point.

Recommendation:
(R-32) CIRNAC recommends that AEM define contingency approaches and mitigations for pit reconnection decisions where arsenic (or other key parameters) does not meet predicted concentrations, including delayed reconnection, additional treatment, or alternative end-state configurations.

33. Modelling horizon does not fully capture late-time source term evolution

Comment:
Water quality prediction plots and tables in Appendix 6E extend only to approximately 2069, despite source term projections being available well beyond that period and physical changes (e.g., active layer penetration of thick WRSF covers) expected later. This truncation limits evaluation of late-time water quality risks.

Recommendation:
(R-33) CIRNAC recommends that AEM extend water quality predictions and plots to align with the full source term modelling period (or justify the cut-off), and present late-time results

for key parameters (e.g., arsenic) that are relevant to pit lake reconnection and discharge decisions.

34. Long-term recontamination risk from in-pit tailings

Comment:
The closure concept relies on removal of reclaim water, followed by reflooding of the Goose and Portage pits containing in-pit tailings, with the expectation that water quality will remain acceptable over the long term. While modelling has been used to support this assumption, the submission does not clearly demonstrate that the in-pit tailings will not act as a persistent or delayed source of contaminants through diffusion, porewater exchange, resuspension, or chemical evolution under flooded conditions. Given the long timeframes involved and the importance of pit lake water quality to reconnection decisions, this represents a material uncertainty.

Recommendation:
(R-34) CIRNAC recommends that AEM explicitly demonstrate with modelling and/or site-specific data, that in-pit tailings will not result in long-term degradation of pit lake water quality following reflooding, including consideration of diffusive fluxes, geochemical evolution, and potential disturbance mechanisms.

35. Removal of committed rock cover over in-pit tailings

Comment:
In the approved ICRP, AEM committed to placing granular rock covers over tailings in the Goose and Portage pits. The commitment was made in response to community concerns that were expressed during approvals processes for in-pit tailings disposal. The proposed updates to the ICRP remove this commitment without clearly demonstrating that site conditions, environmental context, or regulatory expectations have changed in a way that would justify revising the approved approach. Although Fisheries and Oceans Canada (DFO) has concluded the flooded pits do not qualify as acceptable offsetting habitat, aquatic biota (including fish) are likely to colonize portions of the flooded pits after closure. The rock cover would provide a physical barrier to limit direct contact between aquatic biota and tailings/sediments with elevated metal concentrations.

Recommendation:
(R-35) CIRNAC recommends that AEM either: (i) provide clear evidence that the environmental context of in-pit tailings disposal has materially changed since the commitment was made and the practice was approved; or (ii) implement the previously committed rock cover over in-pit tailings.

36. Tailings resuspension and physical disturbance under flooded conditions

Comment:
The submission does not clearly address whether tailings resuspension could occur following reflooding due to thermal turnover, ice processes, density currents, slope instability, or external disturbances, particularly in the absence of a rock cover. Even infrequent resuspension events could affect turbidity, metal concentrations, and downstream water quality, with implications for reconnection and long-term monitoring.

Recommendation:
(R-36) CIRNAC recommends that AEM assess tailings resuspension potential under flooded conditions, including identification of credible disturbance mechanisms and evaluation of whether additional mitigation (e.g., minimum water cover depth, localized armouring, or operational controls) is warranted.

37. Regulatory and closure consistency of changing the in-pit tailings end state

Comment:
The decision to eliminate the in-pit tailings cover represents a substantive change from the closure concept under which in-pit deposition was originally approved. The submission does not clearly explain how this change aligns with regulatory expectations or whether it alters the risk profile that informed earlier approvals.

Recommendation:
(R-37) CIRNAC recommends that AEM explicitly reconcile the revised in-pit tailings closure approach with prior approvals and commitments, and confirm whether additional regulatory review or concurrence is required as a result of this change.

38. Status and suitability of partially treated reclaim water

Comment:
The revised ICRP proposes transfer of partially treated reclaim water from the Goose and Portage pits for permanent storage into the Vault Pit. Although not stated in the submission, CIRNAC assumes that AEM is proposing to store this partially treated water in the Vault Pit because it is not suitable for discharge to the receiving environment (i.e., it does not meet applicable water quality criteria). However, the submission does not identify which parameters remain above criteria following partial treatment, nor the magnitude of exceedance relative to discharge requirements. This information is necessary to understand both the limitations of the current treatment approach and the rationale for selecting permanent storage over discharge.

Recommendation:
(R-38) CIRNAC recommends that AEM explicitly identify the parameters in partially treated reclaim water that exceed applicable discharge criteria, including expected concentrations, comparison to criteria, and whether those exceedances are temporary or persistent.

39. Rationale for abandoning the approved treatment-and-discharge strategy

Comment:
The approved ICRP closure concept was based on treatment of reclaim water in the Goose and Portage pits followed by discharge to the environment, with pit reflooding and reconnection thereafter. The revised strategy replaces this approach with permanent storage of partially treated water in the Vault Pit, but the submission does not clearly explain why the previously approved strategy is no longer viable or how the revised approach is environmentally superior.

Recommendation:
(R-39) CIRNAC recommends that AEM provide a clear, structured rationale for moving away from the approved treatment-and-discharge strategy, including comparison of environmental performance, long-term risk, regulatory implications, and closure liability between the two approaches.

40. Demonstration of in-pit treatment performance

Comment:
AEM reports that in-pit aeration initiated in Goose Pit has been successful in removing thiocyanate and enhancing nitrogen compound degradation. However, no detailed technical documentation has been provided to substantiate treatment performance, limiting the ability to evaluate the effectiveness and reliability of in-pit treatment of nitrogen compounds and metals as a closure measure.

Recommendation:
(R-40) CIRNAC recommends that AEM provide technical performance reports for in-pit water treatment conducted to date, including monitoring data, treatment mechanisms, seasonal limitations, and implications for long-term closure water quality.

41. Status and readiness of the closure water treatment system

Comment:
Notwithstanding AEM's new proposal to deposit non-compliant water in the base of the Vault Pit, the revised ICRP indicates that AEM continues to assess water treatment options that are capable of treating reclaim water to levels that would be amenable to direct discharge to the environment, as per the approved ICRP. In this regard, AEM reports that bench-scale testing and semi-passive treatment development have been ongoing since 2021. Despite

this, a comprehensive description of the closure Water Treatment Plan (WTP) design, performance assumptions, and readiness has not been provided, limiting CIRNAC's ability to assess feasibility, residual risk, and associated security requirements.

Recommendation:
(R-41) CIRNAC recommends that AEM submit a detailed description of the proposed closure water treatment system, including treatment technologies, testing results, design criteria, expected effluent quality, operational duration, and implications for closure reclamation security.

42. Consistency with the approved ICRP

Comment:
Given that reclaim water is already proposed to undergo aeration and active treatment prior to transfer to the Vault Pit, it is unclear why this water cannot be treated to meet applicable discharge criteria and released to the environment, consistent with the approved ICRP. The revised approach appears to introduce permanent storage of treated but non-compliant water without clearly demonstrating that further treatment to discharge standards is infeasible or unreasonable.

Recommendation:
(R-42) CIRNAC recommends that AEM explicitly demonstrate why treated reclaim water cannot be further treated to meet discharge criteria under the approved closure strategy, including identification of limiting parameters, technical constraints, or disproportionate impacts.

43. Basis for differing Waste Rock Storage Facility (WRSF) cover thicknesses (Meadowbank vs. Whale Tail)

Comment:
The closure design specifies a 4.0-m non-potentially acid generating/metal leaching (NPAG/NML) cover for Meadowbank WRSFs and a 4.7 m cover for Whale Tail WRSFs. Based on the information provided, the conditions influencing thermal performance appear to be generally similar between the two sites (e.g., climate, waste rock properties, pile geometry, and exposure). Given these similarities, it is unclear why the cover design thicknesses for the two sites are different. Without an explicit comparison, it is difficult to confirm that both designs provide equivalent long-term performance.

Recommendation:
(R-43) CIRNAC recommends that AEM clearly document the technical basis for differing WRSF cover thicknesses between the Meadowbank and Whale Tail sites, including a side-by-side comparison of thermal modelling inputs, assumptions, and performance outcomes.

44. Active layer penetration through the thermal covers

Comment:
Thermal modelling referenced in the ICRP and Water Quality and Load Balance Model (WQLBM) indicates that, under future climate scenarios, the active layer within the WRSFs is expected to deepen to approximately 5 m (and locally up to ~6 m by 2170), exceeding the design thickness of the NPAG/NML covers. While some thaw below the cover appears to have been anticipated in the modelling, the design rationale for selecting cover thicknesses that are less than the predicted active layer depth is not clearly articulated in the ICRP.

Recommendation:
(R-44) CIRNAC recommends that AEM explicitly explain why cover thicknesses were not increased to fully accommodate predicted active layer depths, and to quantitatively demonstrate how thaw beneath the covers affects long-term seepage quality and loading, including confirmation that this effect is conservatively captured in the water quality source terms.

45. Availability and adequacy of detailed thermal modelling reports

Comment:
The ICRP and WQLBM reference thermal modelling work (e.g., Okane, 2022) indicating significant future active layer deepening, particularly at Whale Tail; however, the detailed thermal modelling reports themselves do not appear to be included in the submission. Summary statements are insufficient to independently assess model assumptions, boundary conditions, calibration, and uncertainty.

Recommendation:
(R-45) CIRNAC recommends that AEM provide updated thermal modelling reports for both Meadowbank and Whale Tail WRSFs, including full documentation of methods, assumptions, calibration, and climate scenarios, to support independent technical review.

46. Progressive reclamation verification

Comment:
AEM indicates that WRSF side slopes and benches have been progressively reclaimed as construction has advanced, but the submission does not provide detailed documentation demonstrating that the constructed covers meet the approved design specifications (e.g., thickness, geometry, continuity). Without formal as-built documentation, CIRNAC cannot confirm closure conformance.

Recommendation:
(R-46) CIRNAC recommends that AEM provide formal as-built documentation for progressively reclaimed WRSF areas, including pre- and post-cover placement surveys, cover thickness verification, NPAG material verification, and confirmation of conformity with the approved closure design.

47. Consideration of non-geochemical closure factors (e.g., wildlife interaction)

Comment:
While geochemical and thermal performance are the primary focus of the WRSF closure design, other closure considerations—such as wildlife interaction (e.g., caribou movement, injury risk associated with coarse waste rock), long-term physical stability, and surface drainage control—are not clearly addressed in the ICRP. These factors can influence long-term environmental performance and land use compatibility.

Recommendation:
(R-47) CIRNAC recommends that AEM clarify how non-geochemical closure considerations (including wildlife interaction, surface roughness, and access control) have been addressed in the WRSF closure design, or identify where additional mitigation or monitoring may be required.

48. Viability of contingency measures for underperforming thermal covers on WRSFs

Comment:
Section 6.5.7 identifies additional placement of NPAG/NML material to increase cover thickness as a contingency if thermal performance is not as predicted. However, the ICRP does not clearly assess whether this measure is practically feasible post-closure, given material availability, access, constructability, and disturbance implications.

Recommendation:
(R-48) CIRNAC recommends that AEM confirm whether post-closure placement of additional cover material is a viable and realistic contingency, and to describe the conditions under which this measure would be implemented, including logistical and environmental constraints.

49. Inconsistent modelling horizons between source terms and water quality predictions

Comment:
The WQLBM indicates that WRSF source terms are modelled through to approximately 2170, including the period when the active layer is predicted to penetrate through the thermal covers and reach depths of up to ~6 m. However, the reported water quality prediction plots and tables do not clearly extend over the same timeframe, and it is therefore not evident

that the water quality implications of late-time active layer penetration are fully evaluated and presented. This disconnect creates uncertainty as to whether incremental loading associated with deeper thaw has been translated into predicted concentrations up to 2170.

Recommendation:
(R-49) CIRNAC recommends that AEM should extend water quality prediction results over the full source term modelling horizon (to at least 2170), or clearly demonstrate how late-time source term changes associated with deeper active layer penetration are reflected in the reported water quality outcomes and closure conclusions.

50. Underground disposal of equipment, demolition debris, and contaminated soils

Comment:
Disposal of machinery, equipment, demolition debris, and contaminated soils within deep underground permafrost zones is expected to present a low risk of contaminant migration, given the thermal stability and limited hydraulic connectivity at depth. However, the ICRP does not clearly define disposal depth criteria or formally constrain underground disposal to zones where long-term permafrost conditions can be confidently relied upon. In addition, it is not clear whether this disposal approach was explicitly included in the originally approved closure concept or whether its acceptability has been confirmed with regulators and stakeholders.

Recommendation:
(R-50) CIRNAC recommends that AEM only dispose of equipment, demolition waste, and contaminated soils in underground locations that are proven to be stable permafrost zones, with clear criteria defining acceptable disposal locations. AEM should also confirm that the practice is consistent with prior approvals and provide documentation of any regulatory or stakeholder concurrence.

51. Cyanide-impacted residues and demolition considerations

Comment:
Experience at other northern mine closures has shown that cyanide-impacted dust and residues within mills and process equipment can complicate demolition and waste handling. While the ICRP describes general cleaning prior to demolition, it does not explicitly assess whether cyanide-impacted residues are expected at Meadowbank or how such materials would be managed prior to underground disposal or landfill placement.

Recommendation:
(R-51) CIRNAC recommends that AEM assess the potential for cyanide-impacted residues or dust within mill and process equipment and, if present, describe the required abatement, verification sampling, and approved disposal pathways.

52. Disposal pathways and acceptance criteria for demolition waste

Comment:
The ICRP identifies multiple potential disposal options for non-hazardous demolition waste (on-site landfill, underground disposal, off-site removal), but does not clearly specify which waste streams will be directed to which disposal locations, nor the acceptance criteria for each. This lack of clarity limits CIRNAC's ability to confirm that disposal practices are appropriate and consistent with closure objectives.

Recommendation:
(R-52) CIRNAC recommends that AEM prepare a waste disposition plan that identifies major waste streams, specifies disposal locations (including confirmation of permafrost-zone disposal where applicable), and documents acceptance criteria, volume estimates, and any required approvals.

53. Confirmation of residual acid rock drainage/metal leaching (ARD/ML) and metals exposure across disturbed footprints

Comment:
The Human Health and Ecological Risk Assessment (HHERA) relies heavily on the conclusion that no soil persistent organic pollutant contaminants (POPCs) will be present post-closure, leading to the determination that direct contact with soil, dust inhalation, and ingestion of plants and wild game are incomplete exposure pathways. However, this conclusion appears to depend on how "soil" is defined and screened, given that extensive disturbed footprints (waste rock pads, ore handling areas, roads, airstrip, mill areas) are constructed of mine materials that are known to have elevated metals concentrations relative to generic soil quality guidelines. The HHERA does not clearly demonstrate how these mine-material surfaces were classified, screened, or excluded from soil POPC identification, nor how ARD residuals were ruled out across these large areas.

Recommendation:
(R-53) CIRNAC recommends that AEM clearly define how disturbed mine-material surfaces (e.g., waste rock pads, ore pads, haul roads, mill foundations) were treated in the HHERA soil screening, and to provide closure confirmation criteria demonstrating that these surfaces are non-potentially acid generating (NPAG) and do not represent ongoing metals exposure pathways to human or ecological receptors.

54. Criteria for identifying "metal contamination" and adequacy of non-potentially acid generating/non-metal leaching (NPAG/NML) cover material

Comment:
The ICRP states that, where metal contamination is identified on ore pads, affected areas will be covered with NPAG/NML waste rock. The HHERA, however, concludes that no soil

POPCs exist, raising ambiguity as to what criteria would trigger this mitigation and how "metal contamination" is defined in closure decision-making. In addition, while NPAG/NML material may be geochemically stable, it may still contain elevated metals concentrations that could be relevant for direct contact or dust exposure.

Recommendation:
(R-54) CIRNAC recommends that AEM define the analytical criteria and decision rules used to classify areas as "metal contaminated" at closure, and to demonstrate that NPAG/NML cover material used for mitigation does not itself represent a metals exposure pathway under post-closure land use assumptions.

55. Exposure scenario assumptions in the HHERA

Comment:
The HHERA evaluates a single human receptor: an adult member of the public, with exposure assumed to occur for a limited duration during post-closure, and concludes that risks from water ingestion and fish consumption are negligible. Other exposure pathways (soil contact, plant and wild game consumption) were screened out due to the absence of soil POPCs. Compared to risk assessments at other northern legacy sites, the exposure duration and receptor selection are relatively limited, and the HHERA does not clearly demonstrate that Inuit land use scenarios involving longer seasonal presence, family groups, or off-site consumption of harvested country foods were explicitly evaluated and agreed upon.

Recommendation:
(R-55) CIRNAC recommends that AEM confirm that Inuit organizations support the exposure scenarios used in the HHERA, including receptor selection, exposure duration, and assumptions regarding harvesting and off-site consumption of country foods, and to document how Inuit Qaujimajatuqangit informed those assumptions.

56. Apparent absence of soil POPCs despite widespread mine disturbance

Comment:
Based on the HHERA, the conclusion that no soil POPCs are present is technically defensible if soil is defined as natural surficial material and mine wastes are intentionally excluded. However, the HHERA does not make this distinction explicit, which creates confusion given the known presence of elevated metals in mine-derived materials documented in Environmental Site Assessments (ESAs) and other site studies.

Recommendation:
(R-56) CIRNAC recommends that AEM should explicitly state whether mine wastes and disturbed mine-material surfaces were excluded from soil POPC screening in the HHERA,

and to justify that exclusion in the context of post-closure land use and exposure assumptions.

57. Chromium in sediments at Third Portage Lake

Comment:
The HHERA acknowledges that in 2023, chromium concentrations in sediments at Third Portage Lake exceeded triggers . The HHERA also notes that concentrations appear to have peaked in 2017 and declined since, and concludes that adverse effects to benthic communities and fish are unlikely. While this interpretation may be reasonable, the closure implications of this residual contamination are not clearly articulated, particularly in terms of whether ongoing management, monitoring, or formal acceptance of residual effects is intended.

Recommendation:
(R-57) CIRNAC recommends that AEM include a clear closure-position statement for chromium-impacted sediments at Third Portage Lake, identifying whether active management, enhanced monitoring, or acceptance with justification is proposed, and how this aligns with long-term closure objectives and liabilities.

58. Interim nature of Closure and Post-Closure Compliance Monitoring Plan (CPCMP) and Adaptive Reduction Framework

Comment:
The ICRP includes a CPCMP and an Adaptive Reduction Framework that are generally appropriate at a conceptual level, but both are being reviewed for the first time under this ICRP and are not yet developed to the level needed to support closure-critical decisions (e.g., reconnection, discharge, security reduction). The documents should be treated as interim and will require substantive refinement as AEM advances toward the final Closure and Reclamation Plan (CRP).

Recommendation:
(R-58) CIRNAC recommends that AEM explicitly state that the CPCMP/Adaptive Reduction Framework are interim and to commit to a revised, CRP-ready version that includes full decision logic, evidence thresholds, and linkages to closure acceptance criteria

59. Technical justification for any monitoring reductions

Comment:
Table 4.2-5 of the CPCMP lists proposed decommissioning dates for several monitoring locations, but the document does not provide the site-specific technical justification required to support removal of existing stations or parameters.

Recommendation:
(R-59) CIRNAC recommends that AEM provide a comprehensive "monitoring change log" that lists every proposed reduction (station/parameter/frequency), the specific performance evidence required to justify the reduction, and a conservative default that no reductions occur unless the justification is met.

60. Linkages to current operational/Water Licence monitoring

Comment:
The CPCMP references alignment with Water Licence station naming and indicates that monitoring during closure is expected to remain closely aligned with operations until a Closure Water Licence is in place. However, it does not clearly provide a side-by-side summary of what changes relative to the current operational plan (added/removed stations, parameters, frequency), which makes it difficult to evaluate adequacy and identify premature reductions.

Recommendation:
(R-60) CIRNAC recommends that AEM provide linkages from the current operational/Water Licence monitoring program to the proposed closure/post-closure program, explicitly summarizing all additions and reductions (stations, parameters, frequency) with rationale.

61. Adaptive Reduction Framework Decision Rules

Comment:
The CPCMP describes an Adaptive Reduction Framework intended to guide reductions in parameters, frequency, and stations, but it does not yet define decision rules (minimum dataset length, seasonality requirements, trend/equivalence tests, treatment of variability, and acceptable false-negative risk). Without that, the removal of monitoring scope becomes a subjective decision that may not be accompanied by appropriate technical justification.

Recommendation:
(R-61) CIRNAC recommends that AEM define quantitative decision rules for adaptive reductions in monitoring, including minimum years/seasons of data, objective statistical tests (trend and equivalence), and "no-reduction" constraints for high-consequence endpoints (pit lakes, Collection Pond 23 discharge, Tailings Storage Facility (TSF) seepage, Waster Rock Storage Facility (WRSF) contact water).

62. Seepage monitoring needs explicit trigger-response linkages

Comment:
The CPCMP describes closure seepage surveys (e.g., twice per year) and ties station naming to the Water Licence, which is a reasonable baseline. However, it does not clearly define what constitutes a "material change" in seep conditions and how seep results trigger

escalation (additional sampling, source attribution, mitigation, or changes to closure sequencing such as delaying reconnection).

Recommendation:
(R-62) CIRNAC recommends that AEM link seepage monitoring to a decision tree with defined triggers and actions, including escalation thresholds and how seep outcomes constrain other closure decisions (e.g., reconnection/discharge timing).

63. Workshop to advance the monitoring/reduction framework

Comment:
Given that the CPCMP and Adaptive Reduction Framework are foundational to post-closure decision-making and future reductions in monitoring burden, early alignment on the decision logic, evidence thresholds, and reduction principles is important before AEM advances to the CRP.

Recommendation:
(R-63) CIRNAC recommends that AEM convene a workshop with key reviewers to walk through the CPCMP network, proposed reductions, adaptive decision rules, and how monitoring supports closure acceptance and security release decisions, and to incorporate outcomes into the CRP-ready CPCMP.

64. Proposed Interim Closure and Reclamation Plan (ICRP) scope changes

Comment:
The revised ICRP includes an updated closure and reclamation security estimate that appears to assume implementation of all revised closure concepts including, for example the revised Tailings Storage Facility (TSF) cover concept and revised water management concept. These revisions represent material scope changes that have not yet been approved. Updating the security estimate on the assumption that all proposed changes are accepted is premature and risks embedding unapproved scope into the secured liability.

Recommendation:
(R-64) CIRNAC recommends that AEM clearly identify which components of the revised security estimate are based on approved closure concepts versus proposed (unapproved) revisions, and to explicitly flag any portions of the estimate that rely on assumptions that remain subject to regulatory review and approval.

65. Security release framework

Comment:
The ICRP and Appendix 6J indicate an expectation that a portion of reclamation security associated with the TSF would be returned following completion of closure construction. While the responsibility for defining the security release process ultimately rests with regulators and Inuit organizations, the absence of a clearly articulated framework (information requirements, timing, holdbacks, and performance confirmation) creates uncertainty for all parties and increases the risk of misaligned expectations.

Recommendation:
(R-65) CIRNAC recommends that AEM proactively engage with regulators, CIRNAC and the KivIA to collaboratively develop and document a clear framework for closure security release, including information requirements (e.g., as-built documentation, quality assurance/quality control (QA/QC) records, monitoring duration), decision criteria, sign off requirements, timing, and any holdback provisions, and to reflect that framework in future closure and security submissions.

66. Evidence requirements to support security reduction

Comment:
The evidence that the ICRP indicates will be used to support security reductions (e.g., photographs, engineering verification, inspection sign-off) that are high-level and do not clearly define what constitutes acceptable performance for large, high-consequence closure works such as the TSF and long-term water management infrastructure.

Recommendation:
(R-66) CIRNAC recommends that AEM develop component-specific acceptance and evidence packages that define measurable performance criteria, minimum monitoring or observation periods, and documentation requirements that must be met before security associated with each major closure component can be reduced.

67. Escalation, inflation, and timing of security updates

Comment:
The current security estimate relies on unit rates that are approximately seven years old. As evidenced by recent security estimate updates at other AEM mines in Nunavut (e.g., Meliadine and Doris), the use of dated unit rates has the potential to underestimate reclamation securities by more than 30%. Delaying adjustment of unit rates until all closure scope decisions are finalized risks under-securing the project during an interim period when closure liabilities remain significant.

Recommendation:

(R-67) CIRNAC recommends that AEM immediately update the closure and reclamation security estimate to reflect current unit rates and inflation, independent of unresolved ICRP scope changes, and to commit to a subsequent update once the revised ICRP scope is finalized and the updated RECLAIM 8 framework has come into effect.