Water Resources Division
Resource Management Directorate
Nunavut Regional Office
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Your file - Votre référence
2AM-MEA1530
Our file - Notre référence
GCDocs#131767466

December 24, 2024

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 (CIRNAC's) Reply to Agnico Eagle's Response to Review Comments on the 2024 Modification Request for the Development of a Site-Specific Water Quality Objective for the Meadowbank Gold Mine Projects, Type A Water Licence 2AM-MEA1530.

Dear Mr. Dwyer,

Thank you for your December 04, 2024, invitation to review Agnico Eagle's response to review comments on the 2024 Modification Request for the Development of a Site-Specific Water Quality Objective for Meadowbank Gold Mine Projects, submitted by Agnico Eagle Mines Limited, for Type A Water Licence 2AM-MEA1530.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) examined the response 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's reply in the attached Technical Memorandum for the Nunavut Water Board's consideration.

If there are any questions or concerns, please contact me at Aminul.Haque@rcaanc-cirnac.gc.ca or (867) 975-4282 or Andrew Keim at (867) 975-4550 or Andrew.Keim@rcaanc-cirnac.gc.ca.

Sincerely,

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Aminul Haque
Senior Environmental Assessment Specialist

Technical Review Memorandum

Date: December 24, 2024

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

From: Aminul Haque, Senior Environmental Assessment Specialist, CIRNAC

Subject: **Crown-Indigenous Relations and Northern Affairs Canada's (CIRNAC's) Reply to Agnico Eagle's Response to Review Comments on the 2024 Modification Request for the Development of a Site-Specific Water Quality Objective for the Meadowbank Gold Mine Projects, Type A Water Licence 2AM-MEA1530.**

Region: ☐ Kitikmeot ☒ Kivalliq ☐ Qikiqtani

RESULTS OF REVIEW

Overall Conclusion

It is CIRNAC's opinion that the 2024 Modification Request for the Development of a Site-Specific Water Quality Objective (SSWQO) for Type A Water Licence 2AM-MEA1530 is relevant only to the closure phase of the Meadowbank Mine. Specifically, an SSWQO should be used to regulate the discharge of total dissolved solids (TDS) applicable during the dewatering, treatment, and discharge of reclaimed water from pits containing tailings. Although not stated by Agnico Eagle, CIRNAC understands that the criteria would also be relevant to water quality in the re-flooded pit (i.e., after treatment and discharge of reclaimed water).

Based on the above, the quality of water discharged to the environment will be dependent on numerous factors, including but not limited to: a) the future quality of tailings and reclaim water discharged into the pits up until closure; b) any covers placed on in-pit tailings that may reduce the flux between the tailings and reclaim water; c) other source terms contributing to the pits; and d) the water treatment technologies that will be used to treat pit water prior to discharge to the environment. While there continues to be significant uncertainty regarding each of these factors, CIRNAC expects that the closure planning process for the Meadowbank Mine will be used to address such uncertainties. For example, the closure planning process should determine whether in-pit tailings covers are necessary and evaluate all viable water treatment technologies to confirm that the discharge of potential contaminants is as low as reasonably achievable. Information on these aspects needs to be provided for full review by all relevant parties.

Given that such information is not yet available and that the modification request relates only to closure, CIRNAC concludes that it is premature to modify the site's water quality closure criteria at this time. Instead, CIRNAC recommends that any decisions regarding closure water quality criteria be determined only within the context of the NWB licence approval

process for the eventual closure of the Meadowbank Mine. This is particularly important if Agnico Eagle proposes to use less conservative water quality criteria such as SSWQO.

CIRNAC's Reply to Agnico Eagle's Statements Presented in the Preamble:

CIRNAC acknowledges Agnico Eagle's reference to Part E, Item 7 of the Water Licence, which allows for developing site-specific water quality objectives (SSWQO), subject to Nunavut Water Board (NWB) approval. However, CIRNAC understands that achieving baseline water quality concentrations for re-flooded areas should be the priority, and site-specific objectives can be considered only as a last resort. Agnico Eagle has not clearly explained why baseline water quality concentrations cannot be achieved. CIRNAC believes alternative water treatment options should be explored and implemented to meet closure water quality objectives.

CIRNAC also notes the NWB's previous guidance, issued on February 8, 2019, regarding the deposition of in-pit tailings. At the time, Agnico Eagle maintained that the changes would not result in alterations to water quality, quantity, or flow and thus did not require an amendment. The current proposal to establish SSWQO for TDS, particularly given the measured exceedances of predicted values, contradicts these earlier assurances. This reinforces CIRNAC's position that appropriate water treatment measures should be implemented instead of developing site-specific criteria, which risk fulfilling the closure objectives.

While CIRNAC agrees with Agnico Eagle's clarification that the current notice does not propose effluent discharge, the proposed SSWQO would effectively allow effluent discharge with significantly higher TDS concentrations than initially predicted. This poses a potential risk to the receiving environment and challenges the overarching goal of protecting aquatic ecosystems during closure and post-closure. CIRNAC maintains that achieving baseline water quality concentrations should remain the primary objective, and water treatment options should be employed to meet this requirement. Developing site-specific criteria should only be considered as a final measure if all other options have been exhausted and with clear justification.

CIRNAC's Reply to Agnico Eagle's Response to Review Comments:

1. In-Pit Tailing Deposition

Comment:

Table 4-1 (section 4, page 32) of the submitted Water Management Plan (Version 13, dated August 2024) shows that between 2021 and 2023, the measured TDS for Goose Pit was on average 275% higher than predicted values. This indicates that the water quality modelling assumptions assessed during the amendment process for the in-pit tailing deposition were inaccurate. This fact was reflected in Agnico Eagle's statement in its current operational notice: "The implications of increasing contaminant loading would be the risk of not being able to meet the Pit water quality criteria at closure."

During the in-pit deposition amendment process, intervenors, including CIRNAC, expressed concern about meeting the flooded pit water quality objectives and highlighted the need for mitigation measures. On 31 January 2019, CIRNAC included the following statement in its communication with the NWB: “CIRNAC sees this amendment as a new ‘use’ of water as it will now serve as a tailings cover. The amendment also risks affecting the quality of water as it involves a new deposition of waste into waters that are meant to be reconnected with the natural environment.”

However, Agnico Eagle assured it would meet all the water quality objectives without impacting the environment. In its guidance correspondence regarding the in-pit tailings deposition on 08 February 2019, the NWB mentioned that: “Agnico Eagle has, throughout the Board’s consideration of the In-Pit Tailings Disposal Modification Proposal, maintained that an amendment is not required, and alternatively if an amendment process is to be undertaken that the changes proposed will not result in any changes to water quality, quantity or flow.”

Failure to meet the water quality objective for the pit lakes used for the in-pit tailings deposition (i.e., Portage Pit E and Goose Pit) indicates that the environmental risk associated with these activities has not been properly assessed. In addition, this also indicates that the mitigation measures identified in the Interim Closure and Reclamation Plan (ICRP) are unsatisfactory and that the Final Closure and Reclamation Plan (FCRP) should adequately address this issue. It is CIRNAC’s view that allowing more contaminant loading through site-specific criteria is not recommended and that Agnico Eagle should take appropriate mitigation measures to meet the water quality objectives during closure.

Furthermore, allowing site-specific criteria when a licensee is unable to meet the water quality objectives outlined in its license is setting a precedent for future failure. This compounds the assessed environmental risks and may undermine the cumulative risk considered during the regulatory process when approving an undertaking.

Recommendation:

(R-01) CIRNAC recommends that the NWB not allow site-specific water quality objectives for pit lakes used for in-pit tailing deposition. Instead, Agnico Eagle should be required to implement appropriate mitigation measures to achieve the post-closure pit lake water quality objectives.

Agnico Eagle’s Response:

Agnico Eagle is following the process as set out under Part E, Item 7 of the Water Licence in situations where predicted pit flood water quality post-closure indicates treatment may be necessary. As per Part E, Item 7 of Water Licence 2AM-MEA1530 (emphasis added):

“The Licensee shall submit a Water Management Plan on an annual basis to the Board for review following the commencement of Operations. The Plan must include an updated Water Balance. The Water Management Plan shall include an action plan to be implemented if predicted reflooded pit water quality indicates that treatment is necessary. The Licensee shall not breach dikes until the water quality in the re-flooded area meets CCME Water

Quality Guidelines for the Protection of Aquatic Life, baseline concentrations, **or appropriate site specific water quality objectives.** Subject to the Board approval, **if water quality parameters are above CCME Guidelines, a site specific risk assessment must be conducted to identify water quality objectives that are protective of the aquatic environment."**

Mitigation measures have already been implemented to minimize increasing TDS during Operations, but as a precautionary step, Agnico Eagle has proactively prepared an action plan to address the potential future risk of TDS to the aquatic receiving environment at closure. Since there are no available CCME guidelines for TDS and the model predictions indicate baseline conditions for TDS would not be achievable in the pit lakes, there was a need to assess the true risk to the aquatic receiving environment by completing the following risk assessments:

- Acute toxicity of TDS at the point of discharge (Appendix A of SSWQO memo provided as part of the notification to NWB)
- Chronic toxicity of TDS at the edge of the mixing zone (Appendix B SSWQO memo provided as part of the notification to NWB)
- Evaluation of the assimilative capacity of TDS in the receiving environment

Part E, Item 7 of the Water Licence allows for the development of an appropriate site-specific guideline, subject to NWB approval. An increase in a particular parameter of concern does not necessarily equate to catastrophic environmental impacts, particularly when the parameter of concern is TDS in which the ionic composition and toxic response to aquatic organisms can differ greatly among sites.

As such, Agnico Eagle has undertaken a site-specific risk assessment to develop appropriate site-specific water quality objectives (EQC and SSWQO) for TDS.

The site-specific water quality objectives proposed contain sufficient conservatism that it would be protective of all aquatic life. The site-specific TDS EQC and SSWQO that Agnico Eagle is proposing were developed following the preferred CCME methodologies using species sensitivity distribution approaches where there are adequate primary and secondary toxicity data available to develop an appropriate guideline. The methods used for developing the EQC and SSWQO were adopted and recommended by the CCME that they themselves apply in the derivation of water quality guidelines for the protection of aquatic life (CCME 2007).

CIRNAC's Reply to Agnico Eagle's Response:

CIRNAC acknowledges Agnico Eagle's reference to Part E, Item 7 of Water Licence 2AM-MEA1530, which allows for developing site-specific water quality objectives (SSWQO). However, in CIRNAC's view, the primary intent of this provision is to ensure that re-flooded pit water quality meets baseline concentrations or CCME guidelines. CIRNAC is concerned that Agnico Eagle has not provided sufficient justification for why achieving baseline concentrations through mitigation measures and/or water treatment is not feasible.

During the in-pit tailings deposition amendment process, Agnico Eagle assured the NWB that the changes would not impact water quality, quantity, or flow. The current proposal to

establish an SSWQO due to elevated TDS concentrations contradicts these earlier assurances. It raises concerns about the robustness of past water quality predictions and the effectiveness of mitigation measures.

Although CIRNAC agrees with Agnico Eagle's clarification that this proposal does not involve immediate effluent discharge, adopting an SSWQO would set a precedent for allowing discharge with significantly elevated TDS concentrations. This risks the receiving environment and undermines closure objectives, particularly when baseline concentrations remain the standard in the Water Licence.

Until these issues are addressed, CIRNAC cannot support the development of site-specific TDS water quality objectives. Achieving baseline concentrations or CCME guidelines must remain the primary focus to ensure long-term environmental protection and regulatory compliance.

2. Uncertainty and Potential Risks

Comment:

Several critical gaps exist in determining the Effluent Quality Criterion (EQC) and Site-Specific Water Quality Objective (SSWQO) for Total Dissolved Solids (TDS) as proposed in Meadowbank's Water Management Plan, leading to uncertainties and risks for the environment.

- Assimilative Capacity: A comprehensive assessment of the environment's capacity to absorb and dilute TDS without ecological harm is missing. Without this, setting accurate EQC and SSWQO values is problematic, risking discharge levels that exceed the natural tolerance of water bodies, potentially leading to long-term damage.
- Interim Benchmarks: The EQC (4,000 mg/L) and SSWQO (1,000 mg/L) are interim, pending validation through future studies. For instance, toxicity tests on Rainbow Trout planned for fall 2024 should help confirm these benchmarks. This interim status creates uncertainty about whether these levels will protect the environment, especially since they are based on incomplete data.
- Chronic Toxicity: The SSWQO (1,000 mg/L) aims to prevent chronic toxicity. However, there is limited data on the long-term impacts of even low-level TDS exposure on aquatic life. The chronic effects of TDS on sensitive species and ecosystems can vary widely depending on local conditions, and there has been insufficient site-specific research into these long-term impacts. Additionally, the acute toxicity focus (EQC at 4,000 mg/L) does not sufficiently address the risk of sub-lethal, long-term impacts that could emerge over years of exposure to TDS concentrations even below this threshold.
- Geographic Applicability: The TDS benchmarks are based on site-specific water quality programs and toxicity tests for the Meadowbank area. However, these studies

might not account for regional variability. The water bodies in this region might have different sensitivity levels, hydrological patterns, and baseline water quality compared to those used to establish the site-specific benchmarks. Therefore, the EQC and SSWQO might not be sufficiently conservative to account for variations in environmental conditions outside the study areas, leading to an underestimation of the impact on broader ecological systems.

- Over-Reliance on Model Predictions: There has been more than a 20% difference between predicted and measured TDS values in the pit lakes. This indicates a significant gap between the modelling and reality. It also suggests that the models that predict TDS levels are incomplete and/or inaccurate in reflecting actual site conditions. Agnico Eagle's reliance on these models without substantial real-world validation means a gap in empirical data to support the EQC and SSWQO determinations.
- Inconsistent Monitoring and Data Gaps: There are indications that the data collection process for TDS concentrations, especially in tailings and pit lakes, has not been consistent enough to provide a solid foundation for setting permanent benchmarks. The gap in historical and real-time monitoring data further complicates the determination of effective EQC and SSWQO values, as it is unclear whether the collected data fully captures the seasonal and long-term trends in TDS levels.
- Cumulative Impacts: The cumulative impact of discharging TDS over time has not been thoroughly considered. The site-specific benchmarks might allow for gradual increases in TDS concentrations that could accumulate in the ecosystem, leading to degradation over time. Without a full assessment of cumulative effects on the aquatic system, regulators cannot be confident that the environment will remain protected in the long term. Accepting site-specific benchmarks without fully understanding how TDS levels interact with other contaminants and natural processes over time would undermine regulatory responsibilities to safeguard environmental health.
- Limited Margin for Error: The high EQC value of 4,000 mg/L for TDS suggests that the system is being pushed close to the upper limit of toxicity. This leaves little margin for error, especially if there are unforeseen water chemistry fluctuations or the mixing zone does not behave as expected. This does not ensure protection against unexpected events, like sudden changes in water flow or contaminant loads, which could push the system beyond safe thresholds.
- CCME Guidelines: Approving the EQC and SSWQO may result in TDS concentrations that do not align with the Canadian Council of Ministers of the Environment (CCME) guidelines, which would put regulators in a position of allowing site-specific standards that are less protective than national guidelines.

CIRNAC rejects the site-specific EQC and SSWQO for TDS due to the significant uncertainty, data gaps, and risks of long-term environmental harm. The reliance on interim, incomplete data and the possibility of exceeding national water quality guidelines makes the

current plan unsuitable for approval. Instead, adherence to CCME guidelines offers a more precautionary, scientifically grounded approach to protecting aquatic ecosystems in the region.

Recommendation:

(R-02) CIRNAC recommends that the NWB reject the proposed site-specific EQC and SSWQO for TDS due to significant uncertainty, data gaps, and risks of long-term environmental harm. Following CCME guidelines would offer a more precautionary and scientifically sound approach to ecosystem protection.

Agnico Eagle's Response:

Agnico Eagle respectfully disagrees with CIRNAC's comments as Agnico Eagle is following existing conditions Water Licence that has been developed in rigor and approved by multiple parties. In addition, through this submission Agnico Eagle has presented data that provides certainty and demonstrated no long-term environmental harm. Agnico Eagle requires certainty that the Water Licence can be relied upon as a regulatory road map to meet operational needs.

There is no better precautionary and scientifically sound approach for long-term ecosystem protection available in Canada than the process that Agnico Eagle has already undertaken for TDS by following CCME protocols (2007) for the derivation of a site-specific water quality guidelines for the protection of aquatic life, particularly for a parameter such as TDS for which CCME guidelines do not exist.

As mentioned in the SSWQO technical memorandum prepared by WSP (provided as part of the notification to NWB), a very rigorous screening process was undertaken, including extensive literature review in addition to site specific toxicity testing to derive the interim benchmarks. The EQC of 4,000 mg/L was very conservative given that no acute toxicity was observed to fish or invertebrates exposed to Pit E and Goose Pit water at TDS concentrations above 10,000 mg/L. Likewise the SSWQO of 1,000 mg/L was also conservative given that we observed no chronic toxicity to invertebrates and algae (most sensitive species) at TDS below 2,200 mg/L.

CIRNAC's Reply to Agnico Eagle's Response:

CIRNAC acknowledges Agnico Eagle's response to the concerns regarding uncertainty and potential risks associated with the proposed Site-Specific Water Quality Objective (SSWQO) for Total Dissolved Solids (TDS). However, significant gaps remain in the information provided, particularly in addressing uncertainty, long-term harm, assimilative capacity, chronic toxicity, and geographic applicability.

Agnico Eagle claims its proposed SSWQO is based on conservative assumptions and adequate toxicity data. However, the datasets used to derive the SSWQO appear limited in scope, with no evidence of long-term site-specific toxicity testing for all relevant species. Additionally, Agnico Eagle relies heavily on predictive models. Yet, historical discrepancies between modelled and observed TDS concentrations suggest that the models may not

accurately reflect real-world conditions, particularly for post-closure scenarios. Without robust empirical data or validated models, uncertainty remains high regarding the SSWQO's ability to protect aquatic ecosystems in the long term.

Agnico Eagle's assertion that there is no risk of long-term harm is unsubstantiated, given the absence of long-term monitoring data and a cumulative effects assessment. This raises questions about the reliability of the proposed benchmarks and the adequacy of the risk assessments conducted. While Agnico Eagle mentions adaptive management strategies, the specifics of these plans are unclear. For example, what mitigation measures will be implemented if post-closure water quality fails to meet objectives?

CIRNAC highlighted the need for a comprehensive assessment of the receiving environment's assimilative capacity to ensure the SSWQO protects local ecosystems. While Agnico Eagle referenced an assimilative capacity study, it did not provide sufficient details to demonstrate how it accounts for seasonal variations, cumulative impacts, and long-term changes in the receiving environment. Furthermore, the study has not been validated against monitoring data or peer-reviewed findings, leaving significant gaps in understanding the ecosystem's ability to absorb TDS without harm.

CIRNAC raised concerns about the lack of emphasis on chronic toxicity in the development of the SSWQO. While Agnico Eagle referenced its adherence to the CCME species sensitivity distribution (SSD) methodology, it provided no details on the duration of its toxicity studies, the endpoints evaluated, or whether chronic toxicity thresholds were adequately considered. This omission is critical, as chronic exposure to elevated TDS levels could lead to sub-lethal effects on sensitive aquatic species' growth, reproduction, and survival. Without long-term, site-specific toxicity data, it is impossible to confirm that the SSWQO will prevent chronic toxicity.

CIRNAC also expressed concerns about whether the toxicity data used to derive the SSWQO adequately reflects the unique environmental conditions at Meadowbank. Agnico Eagle asserted that the SSD approach aligns with CCME guidelines. Still, it did not provide evidence demonstrating the applicability of the datasets to Meadowbank's site-specific water chemistry, hydrology, and aquatic species. Geographic variability in factors such as water chemistry and ecosystem sensitivity can significantly influence the toxicity of TDS. The lack of validation for the benchmarks in the context of downstream ecosystems and their cumulative impacts remains a significant gap.

3. Water Quality Parameter Exceedances

Comment:

Part E, Item 9 of the current license stated:

"The Licensee shall, on an annual basis during Operations and Closure, compare the predicted water quantity and quality within the pits, to the measured water quantity and quality. Should the difference between the predicted and measured values be 20% or

greater, then the cause(s) of the difference(s) shall be identified and the implications of the difference shall be assessed and reported to the Board."

In the operational notice for the development of a site-specific water quality objective for TDS, Agnico Eagle mentioned the following:

"Causes associated with measured concentrations of TDS exceeding forecasted model predictions in the pits by more than 20% were identified to be related to measured water levels that were either higher or lower than predicted in the model, and/or increased/decreased infiltration rates from surface runoff resulting in increase/decrease in contaminant loadings depending on the year in question (see Section 4.4.3.1 of the 2023 Annual Report, (included as Appendix A in this notification)."

Agnico Eagle's explanation for the TDS exceedances, when compared to forecasted values, is unclear and fails to identify any specific causes. Moreover, while the operational notice only addresses TDS exceedances, Appendix 16 of the 2023 Annual Report (Meadowbank Predicted Water Quantity and Quality, 2012-2023) reveals exceedances of other water quality parameters. For example, on page 19 of Appendix 16, the dissolved arsenic concentration for Goose Pit in 2022 exceeded the predicted value by 21,926%. The predicted value was 0.002 mg/L, while the actual measured mean was 0.3524 mg/L, far surpassing the CCME guideline of 0.005 mg/L.

According to the licensing conditions outlined in Part E, Item 9, any water quality parameter that exceeds the 20% threshold when compared to model predictions should be reported. However, Agnico Eagle only reported TDS exceedances and failed to acknowledge or investigate the causes of other water quality exceedances, such as arsenic. This oversight reflects a lack of consideration in identifying the reasons for these exceedances and determining appropriate mitigation measures.

Developing site-specific criteria for TDS poses a risk to environmental integrity and does not address the broader issue of meeting post-closure pit water quality objectives. Instead of focusing solely on site-specific criteria, it is crucial for Agnico Eagle to identify the underlying causes of these water quality exceedances and develop appropriate mitigation strategies.

Recommendation:

(R-03) CIRNAC recommends that Agnico Eagle investigate the causes of exceedances for all water quality parameters, not just TDS, and develop appropriate mitigation measures to ensure compliance with post-closure pit water quality objectives. This approach will help address the broader environmental risks and ensure long-term ecosystem protection.

Agnico Eagle's Response:

For clarity, there is no exceedance of TDS because it is not being discharged to the environment. As per the Water Licence conditions noted in the previous responses, which defines the approach, the focus of this particular notice was specifically targeting TDS. Other parameters of concern may be assessed for risk in the same manner in the future.

CIRNAC's Reply to Agnico Eagle's Response:

Agnico Eagle did not explain the cause of TDS concentration being, on average, 275% higher than predicted values. Agnico Eagle's response primarily focuses on TDS but, as the

licence requires, did not discuss the implication of other water quality parameters that have exceeded model predictions by more than 20%. For instance, dissolved arsenic concentrations in Goose Pit exceeded predicted values by over 21,000%, as reported in Appendix 16 of the 2023 Annual Report. These extreme deviations raise serious questions about the adequacy of predictive models and the robustness of monitoring and reporting mechanisms.

Agnico Eagle stated, "Other parameters of concern may be assessed for risk in the same manner in the future." This implies that Agnico Eagle may seek site-specific criteria for other water quality parameters, such as arsenic, that exceeded predicted values by over 21,000%. This supports CIRNAC's concern that allowing an SSWQO for TDS will set a precedent for developing site-specific criteria for other contaminants predicted to fail to meet the closure objective. Such an approach undermines the intent of the Water Licence, which prioritizes mitigation and treatment measures to achieve closure water quality objectives. By normalizing exceedances through site-specific criteria, the long-term integrity of the receiving environment will be at risk. CIRNAC emphasizes prioritizing baseline concentrations and CCME guidelines alongside robust mitigation measures and treatment options to uphold regulatory compliance and protect the Meadowbank ecosystem.

4. Closure Planning

Comment:

CIRNAC has a wide range of questions and comments regarding the closure planning process for the Meadowbank and Whale Tail sites. As summarized in Appendix A to this technical memorandum, many of these questions and comments have been submitted in prior annual report reviews conducted by CIRNAC and are still unresolved. Some of these questions and comments are related to the post-closure in-pit water quality objectives. Given CIRNAC's concerns regarding the anticipated issue of meeting the post-closure water quality objective for the pit lakes, CIRNAC believes that a more active dialogue on closure planning is justified in addressing the concerns. Considering the relatively limited time before the closure implementation, additional and regular dialogue between Agnico Eagle, regulators, and interested parties would be beneficial. This would help to facilitate reaching technically sound closure and reclamation decisions, as well as approval and implementation of an appropriate site closure strategy to achieve post-closure water quality objectives on time.

Recommendation:

(R-04) CIRNAC recommends that Agnico Eagle convene an annual workshop with regulators and interested parties to discuss closure planning and mitigation measures to meet post-closure pit lake water quality objectives for the Meadowbank and Whale Tail Mines.

The overall goal of the workshop is to a) ensure that all organizations (including Agnico Eagle) are fully informed of closure requirements, b) To assess the adequacy of any

progressive reclamation activities undertaken by Agnico Eagle, and 3) to proactively identify critical issues such as the post-closure pit lake water quality objectives that need to be resolved on a priority basis.

Agnico Eagle's Response:
Agnico Eagle acknowledges that active dialogue on closure planning is justified between the involved organizations and regulators. Agnico Eagle intends to continue providing updates on progressive closure work, closure planning and closure engineering concepts, for both Meadowbank and Whale Tail sites, through the Annual Report and the next version of the Closure and Reclamation Plan.

The next version of the Closure and Reclamation Plan is planned to be submitted in 2025 and will include details on the closure activities, progressive closure completed and planned for the remaining part of operations, as well as monitoring plan framework for closure and post-closure.

Agnico Eagle intends to present to CIRNAC and the KivIA a preliminary version of this Closure and Reclamation Plan before the end of 2024.

As per the Water Licenses (2AM-MEA1530 and 2AM-WTP1830), the Licensee shall submit the Final Closure and Reclamation Plan to the Board for approval at least twelve (12) months prior to the expected end of planned mining.

CIRNAC's Reply to Agnico Eagle's Response:
CIRNAC has no further comments at this time. However, it reiterates the importance of developing a comprehensive and transparent closure plan that aligns with regulatory requirements and ensures the long-term protection of the Meadowbank ecosystem.

5. Water Quality Prediction Methods

Comment:
CIRNAC's review of the 2022 and 2023 Annual Reports provided several recommendations related to the water quality predictions for the Meadowbank and Whale Tail projects. The specific request was as follows:

"CIRNAC recommends that Agnico Eagle revisit the water quality modelling assumptions and approaches used for both Meadowbank and Whale Tail within the next 120 days to ensure all future project decisions (particularly closure) are informed by sufficiently accurate predictions. At a minimum, factors to consider when revisiting the assumptions and approaches include the following:

a) using monthly (or smaller) time steps for all model inputs instead of the current one-year time step;
b) performing hydrodynamic modelling of receivers instead of assuming fully mixed conditions;

c) *performing sensitivity analyses to accurately capture the range of uncertainty associated with water quality predictions;*
d) *expanding efforts to characterize loadings from pit walls".*

CIRNAC's review of Agnico Eagle's response to date concludes that these recommendations have not been fully addressed. In light of the present request related to issues of water quality prediction and the potential risk of not meeting post-closure pit water quality objectives, CIRNAC reiterates its request to address the unresolved and partially resolved items noted above. For additional details on the rationale for the request, please refer to CIRNAC Comment #8 (R-08) on the 2022 Annual Report.

Recommendation:

(R-05) CIRNAC recommends that Agnico Eagle revisit its water quality modelling assumptions and approaches used for the Meadowbank project to ensure all future project decisions (particularly closure) are informed by sufficiently accurate predictions.

Agnico Eagle's Response:

Agnico Eagle has produced an updated water balance and water quality model in 2024 which will be included as part of the CRP.

CIRNAC's Reply to Agnico Eagle's Response:

CIRNAC emphasizes the need for Agnico Eagle to clearly explain its prediction methods, address past discrepancies, and integrate site-specific data into future forecasts to ensure accurate and reliable water quality predictions. CIRNAC looks forward to reviewing the updated water balance and water quality model.

Appendix A: Ongoing Closure and Reclamation Comments to be Addressed During Future Closure Planning Processes.

CIRNAC Closure and Reclamation Comment #	Topic	CIRNAC Recommendation (from prior Annual Report reviews)	Agnico Eagle Response/Action (to CIRNAC's prior Annual Report review comments)
1	Freeze back and Capping Thickness	CIRNAC recommended that Agnico Eagle include a meaningful discussion of the results from the thermal monitoring in the Annual Report. FEIS predictions should be compared with monitoring results and be clearly presented. AEM should present the updated modelling supporting their conclusions that the conceptual plans for thermal encapsulation of the Tailings Storage Facility (TSF) and the Waste Rock Storage Facility (WRSF) remain effective in preventing and controlling deleterious seepage over the long term. Finally, if results show discrepancies from the predicted values, Agnico Eagle should discuss the management actions that should be implemented to address the risk.	Agnico Eagle acknowledges CIRNAC's comment on thermal monitoring of the WRSF and will continue to report in the annual report the work and the data that are being gathered to assess the performance of the WRSF. These data will continue to be analysed to ensure they are aligned with closure prediction and the model will be revised periodically to ensure the goal of meeting closure objective. In 2020 instrumentation installation continued on both sites as per O'Kane recommendation. The data gathered at Meadowbank are aligned with the latest review of the thermal model performed in 2019. Agnico Eagle also acknowledges CIRNAC's comment on the progressive reclamation for the cover of the WRSF. Agnico Eagle will be submitting in due time the necessary documentation to support its claim of completion of the progressive reclamation work done on the WRSF.
2	Freeze back and Capping Thickness	CIRNAC recommended that Agnico Eagle provide more information on the nature and extent of research efforts, the research results, and a discussion of how these results have influenced the proposed cover design.	Refer to the response for 1
3	Progressive Reclamation – Mine Site	CIRNAC recommended that future updates to the ICRP include more details on progressive reclamation at Meadowbank, such as the areas of Tailings Storage Facility (TSF) and Waste Rock Storage Facility (WRSF) facilities covered in the prior year, the total areas covered to date, and the volumes associated with these areas.	In response to 2019-2020 NIRB recommendations, Agnico Eagle has committed to include more details on progressive closure in the 2020 Annual Report. Relevant information on progressive closure can be found in Section 9.1 of the 2020 Annual Report and will continue to be updated annually. Details related to work completed and schedules of progressive reclamation are also included in the closure schedule presented in Appendix P of the ICRP, which was updated in March 2020 and provided in the 2019 Annual Report in Appendix 55. Agnico is of the opinion that the last update, the March 2020 version, fulfills the current request. Agnico Eagle is nevertheless committed to providing more details on the progressive closure in the next iteration of the Meadowbank ICRP.
4	Results of Thermistor Measurements for Tailings and Waste	CIRNAC recommended that Agnico Eagle analyze the thermistor monitoring results against early thermal modelling predictions and update its Waste Rock and Tailings Management Plans if large discrepancies are observed between the	Agnico Eagle is monitoring freeze back in tailings and the waste rock and will continue to do so and expand the monitoring program as required. The data gathered will continue to be analyzed and compared to the FEIS prediction as more data becomes available to ensure that

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	Rock Storage Facilities	monitoring results and model predictions. While the 2020 Annual Report presents a high-level summary of the topic, the document contains insufficient detail to understand the status of thermal monitoring/modelling as it relates to final closure. CIRNAC expects that the next iteration of the Meadowbank ICRP will include a comprehensive analysis of all thermal monitoring data and modelling.	the closure strategy and concept still meet the closure prediction. Agnico Eagle acknowledges CIRNAC's comment and will evaluate this recommendation during the next updated of the Meadowbank ICRP.
5	Meadowbank Water Treatment Requirements	CIRNAC recommended that the next iteration of the Meadowbank ICRP identify and examine potential water treatment scenarios based on current and future water quality projections during the closure phase. Although final decisions are not required at this time, costs associated with implementing the most likely water treatment scenario should also be incorporated into security estimates.	Agnico Eagle acknowledges CIRNAC comments and intends to assess the requirement for treatment of the re-flooded pits within the next iteration of the ICRP.
6	Meadowbank WRSF Seepage Quality	CIRNAC recommended that Agnico Eagle confirm whether the long-term modelling of seepage from the Meadowbank Waste Rock Storage Facilities (WRSFs) is of sufficient duration to characterize seepage after breakthrough. If not, CIRNAC recommends that Agnico Eagle extend the temporal scope of its WRSF seepage modelling to ensure that potential seepage impacts after breakthrough are accurately characterized.	Long-term seepage from the Meadowbank WRSF was not identified as a concern during the FEIS and was not examined. For the next iteration of the Interim Closure & Reclamation Plan, Agnico Eagle will review if this mechanism can have an impact on the closure objectives and, if so, will do the necessary analysis to characterize this impact and develop mitigation measures as required. However, it must be noted that, as opposed to Whale Tail WRSF, there is no metal leaching material in the Meadowbank WRSF, and the pile is expected to remain in permafrost condition, which would suggest that water seeping from the Meadowbank WRSF beyond the NAG capping is unlikely and would have little bearing on the water quality objective at closure.
7	Meadowbank Post-Closure In-Pit Water Quality	CIRNAC recommended that Agnico Eagle: a) Conduct a modelling exercise to predict post-closure water quality in the re-flooded Goose and Portage mine pits at the Meadowbank Gold Mine site. b) Incorporate the findings of the modelling into the next iteration of the Meadowbank ICRP. c) Use the modelling results to inform the design of various other closure components, including but not limited to capping of the in-pit tailings and post-closure water management, water treatment facility designs, sludge generation and disposal, requirements as	a) Agnico Eagle acknowledges CIRNAC' comments. Agnico Eagle will integrate this recommendation during the next update of the Meadowbank ICRP. b) Agnico Eagle acknowledges CIRNAC's comment. Findings of the modelling will be taken into consideration in a future update of the Meadowbank ICRP. c) Agnico Eagle acknowledges CIRNAC's comments. Agnico Eagle will integrate this recommendation during the next update of the Meadowbank ICRP.

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		well-expected treatment duration, all of which should be included in the next iteration of the ICRP.	
8	Meadowbank In-Pit Tailings Covers	CIRNAC recommended that Agnico Eagle: a) Describe the strategy they will use to evaluate cover requirements and methods for the in-pit tailings (e.g., water covers, coarse/fine granular covers, construction/leave a submerged berm at the connection to the pit). b) Provide the strategy and an update on progress towards the selection of a preferred closure concept in the next update to the Meadowbank Interim Closure and Reclamation Plan (ICRP). CIRNAC requested that this information be provided to assist in satisfying the New Commentary of Project Certificate 004 (Amendment 003) Term and Condition 19.	a) Agnico Eagle will present a timeline for further study to determine the requirement of a cover and possible construction strategy during the next update of the ICRP. b) Agnico Eagle will present this information in the next update of the ICRP.
9	Thermal Performance of Meadowbank WRSF Covers	CIRNAC recommended that Agnico Eagle describe the technical rationale for using different WRSF cover thicknesses at the Meadowbank Gold Mine and Whale Tail Pit sites. Any notable differences in the design assumptions for the two sites should be provided in the rationale.	Waste rock covers are designed based on project specific attributes and will naturally have variables that differentiate between sites (i.e., the active layer depth in the region is variable). The freezing mechanism is impacted by the material characteristics, such as the grain size distribution. The attributes of the cover system at Whale Tail include low annual precipitation (less than 300 mm per year); high summer evapotranspiration; coarse-texture soil availability; high spring surface runoff; and creation of low permeability ice barriers. The development of the 4.7 m cover was based on an active layer depth in the WRSF of 4.2 m during operations and closure with an additional 0.5 m for contingency. The active layer was determined by preliminary 1D steady-state numerical modelling and further confirmed by O'Kane's 2D transient model. Both simulations considered predicted effects of climate change. Material properties for the cover system and waste rock materials were calibrated based on observed ground temperature measurements obtained from thermistors in Meadowbank's WRSFs. Numerical modelling considered the effect of slope angle, slope aspect, wind exposure on thermal conditions within the WRSF. Modelling of the WRSF cover system indicates a greater thaw depth in the WRSF than observed regional

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			data. Thus, the thaw depth simulated by numerical modelling, rather than the less conservative regional thaw depth, was used in support of the detailed design of the Whale Tail and IVR WRSF cover system. Agnico Eagle refers CIRNAC to the Whale Tail Project – Thermal Modelling of Whale Tail and IVR WRSFs (O'Kane 2019) report which was previously issued to address CIRNAC's comments under the Whale Tail Expansion Project.
10	Whale Tail Project Post-Closure Water Quality	CIRNAC recommended that Agnico Eagle address the following in the next iteration of the Whale Tail Interim Closure and Reclamation Plan (ICRP): a) Clearly indicate which modelling parameters have been adjusted since the last modelling run. In situations where the level of conservatism has reduced relative to FEIS predictions, appropriate justification should be provided. b) Future modelling results should explicitly and quantitatively report the range of predicted modelling outcomes based on Agnico Eagle's assumptions regarding model prediction accuracy (i.e., +/- one order of magnitude). Any required mitigations should be based on a reasonable worst-case scenario. For example, what actions would be required if post-closure arsenic concentrations in Mammoth Lake are at the upper end of the potential prediction range? c) Water quality predictions should clearly indicate the spatial extent of post-closure water quality exceedances within surface water receivers.	a) Agnico Eagle agrees with CIRNAC to indicate which modelling parameters were adjusted since the last modelling run and to explain situations where the level of conservatism has reduced relative to FEIS predictions. b) Agnico Eagle agrees with CIRNAC for the next iteration of the water quality forecast model to explicitly report the range of predicted modelling outcomes based on model prediction accuracy. c) Agnico Eagle acknowledges CIRNAC's recommendation for the next iteration water quality forecast model to clearly indicate the spatial extent of post-closure water quality exceedances within surface water receivers.