Water Resources Division
Resource Management Directorate
Nunavut Regional Office
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Your file - Votre référence
2AM-MEA1530
Our file - Notre référence
GCDocs#130212911

October 17, 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) Review of the 2024 Modification Request for the Development of a Site-Specific Water Quality Objective for Meadowbank Gold Mine Projects, Type A Water Licence 2AM-MEA1530.

Dear Mr. Dwyer,

Thank you for your August 22, 2024, invitation to review 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 request and its attachments 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 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
A/Senior Environmental Assessment Specialist

Technical Review Memorandum

Date: October 17, 2024

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

From: Aminul Haque, A/Senior Environmental Assessment Specialist, CIRNAC

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

Region: ☐ Kitikmeot ☒ Kivalliq ☐ Qikiqtani

A. BACKGROUND

The Meadowbank Gold Mine is approximately 110 kilometres north of Baker Lake in the Kivalliq region of Nunavut. The complex consists of the Meadowbank mine and mill and the Whale Tail (Amaruq) satellite deposit, located 50 kilometres northwest of the Meadowbank mine. The Project is governed by the current Type A Water Licence No. 2AM-MEA1530 (the Licence).

The project components within the scope of the Meadowbank Gold Mine include a Marshalling Facility at Baker Lake and a 110-kilometre All-Weather Access Road (AWAR) between Baker Lake and the Meadowbank Gold Mine site. There are also water retention dikes constructed using mined waste rock to allow for the mining of ore beneath shallow dewatered lakes and a tailings storage facility (Second Portage Lake's northwest dewatered arm), where tailings have been deposited sub-aerially as slurry and water from the ponds reclaimed during operation.

The Nunavut Water Board (NWB) 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 Board subsequently renewed the original licence in August 2015. It 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 (Agnico Eagle) mining operations at the Whale Tail Pit site.

In February 2018, Agnico Eagle Mines (Agnico Eagle) proposed a modification to its Water Licence (No. 2AM-MEA1526) to allow in-pit tailings disposal. Initially, the Nunavut Water Board (NWB) treated this as a modification, not requiring a formal amendment. However, the Nunavut Planning Commission (NPC) referred the proposal to the Nunavut Impact Review Board (NIRB) for screening, deeming it a significant modification that required

further assessment. In August 2018, NIRB completed its review and allowed the project to proceed without changes to the Project Certificate.

On November 26, 2018, in response to the NIRB's Reconsideration Report and Recommendations, the Minister of Intergovernmental Affairs, Northern Affairs and Internal Trade (the Minister) provided his decision. The Minister raised concerns about potential water quality risks and the importance of avoiding long-term environmental impacts. As a result, the Minister added conditions in the Project Certificate requiring updated hydrogeological modelling to address information gaps and to ensure effective management of water quality risks before in-pit tailings disposal could commence. Furthermore, the Minister emphasized that the proposed modification would significantly alter the project's water use and waste management practices, meaning the current Water Licence no longer covered this activity.

The Minister concluded that a formal amendment to the Water Licence was necessary.. Consequently, the NWB revised its approach and processed the in-pit tailings disposal proposal as an amendment to the existing Water Licence No. 2AM-MEA1526 rather than as a modification; reflecting the Minister's concerns about ecosystem protection and project compliance.The NWB expedited the amendment process by considering the technical review of the initial modification request and waived the technical meeting and public hearing requirements. Once the amendment process was completed, in-pit tailings disposal began in Goose Pit on 5 July 2019 and in Portage Pit E on 20 August 2020.

On August 22, 2024, Agnico Eagle notified the NWB that measured Total Dissolved Solids(TDS) concentrations in Portage Pit E and Goose Pit exceeded forecasted model predictions by over 20%. As required under the licence (Part E, Item 9), Agnico Eagle must compare predicted and actual water quality annually and report any significant discrepancies. Agnico Eagle must also submit a Water Management Plan annually,including an action plan if predicted re-flooded pit water quality indicates that treatment is necessary. Reported increased contaminant loadings may pose a risk in meeting water quality criteria at closure. Agnico Eagle proposes developing site-specific water quality objectives for Portage Pit E and Goose Pit to address the implications of increased TDS loading.

CIRNAC provides the following comments and recommendations with respect to the current modification request to develop a site-specific water quality objective for pit-lakes used for in-pit tailing disposal in Meadowbank Gold Mine Projects. 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	In-Pit Tailing Deposition
R-02	Uncertainty and Potential Risks
R-03	Water Quality Parameter Exceedances
R-04	Closure Planning
R-05	Water Quality Prediction Methods

B. DOCUMENTS REVIEWED AND REFERENCED

The following table (Table 2) lists the documents reviewed under the submission and references during the review.

Table 2: Documents Reviewed and Referenced

Document Title	Author, File No., Rev., Date
2AM-MEA1530 Amended Licence	NWB, 27 March 2020
2AM-MEA1530 TDS -SSWQO_Notice_Appendix A-MBK Complex 2023 Annual Report	AEM, 22 August 2024
2AM-MEA1530 TDS -SSWQO_Notice_Appendix B-2024 AEM MBK Water Mngmt Plan_V13	AEM, 22 August 2024
2AM-MEA1530 TDS -SSWQO_Notice_Final	AEM, 22 August 2024
Appendix 16 – NWB 2023 Annual Report - Meadowbank Predicted Water Quantity and Quality (2012-2023)	AEM, 30 March 2024
2AM-MEA1526 Amendment_In-Pit_CIRNAC_RESPONSE_TO_AEM_15_FEB_2019	CIRNAC, 15 February 2019
2AM-MEA1526 NWB Waiver of PH Tailing In-Pit Deposition Amendment	NWB, 08 February 2019
2AM-MEA1526 Agnico Eagle Responses to January 31 Letters from CIRNAC NRCan ECCC KIA	AEM, 04 February 2019
2AM-MEA1526 In-pit Amendment CIRNAC_Response_to_AEM	CIRNAC, 31 January 2019
2AM-MEA1526 In-pit Disposal NRCan response to Jan 25 email from NWB-IMLE	NRCan, 31 January 2019
190125 2AM-MEA1526 Technical Review ECCC CIRNAC Comment AEM Responses-IMLE	AEM, 25 January 2019
2AM-MEA1526 Tailing In-Pit Next Steps-OMLE	NWB, 30 November 2018
2AM-MEA1526 Agnico Eagle-In pit disposal-Final Response	AEM, 17 August 2018

C. RESULTS OF REVIEW

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 January 31, 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 that it would meet all the water quality objectives without impacting the environment. In its guidance correspondence regarding the in-pit tailings deposition on February 08, 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.

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 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.

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.

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.

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.

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

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)
	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.

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)
		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

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)
			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.