



Water Resources Division
Resource Management Directorate
Nunavut Regional Office
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Your file - Votre référence
2AM-MEL1631
Our file - Notre référence
GCDocs#128017787

July 30, 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 on the 2023 Annual Report Review Comments for the Meliadine Gold Mine Project, Type A Water Licence No. 2AM-MEL1631.

Dear Mr. Dwyer,

Thank you for your July 16, 2024, invitation to review Agnico Eagle Mines' response to the 2023 Annual Report Review Comments for the Meliadine Gold Mine Project, Type A Water Licence No. 2AM-MEL1631.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) examined the Response 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's reply to Agnico Eagle's response in the attached Technical Memorandum for the Nunavut Water Board's (NWB) 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
Regional Water Management Coordinator



Technical Review Memorandum

Date: July 30, 2024

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

From: Aminul Haque, Regional Water Management Coordinator, CIRNAC

Subject: Crown-Indigenous Relations and Northern Affairs Canada's (CIRNAC's)
Reply to Agnico Eagle's Response on the 2023 Annual Report Review
Comments for the Meliadine Gold Mine Project, Type A Water Licence
No. 2AM-MEL1631.

Region: ☐ Kitikmeot ☒ Kivalliq ☐ Qikiqtani

CIRNAC 01: Saline Water Volumes Pumped to Tiriganiaq Open Pit #2 (TIRI02)

Recommendation:

(R-01) CIRNAC recommends that Agnico Eagle:

- a) Explain the difference between the total volume of underground saline water pumped to surface as reported in Section 3.1.3 from 2018 to 2023 to the volumes shown in Figure 14 to 2023, and
- b) Reconcile the differences in the predicted groundwater inflow rate going forward from 2024.

Agnico Eagle's Answer

a) Volumes presented in Table 4 of Section 3.1.3 of the Annual Report are the volumes of water pumped to surface from the underground mine and are consistent with the yearly totals presented in the table provided in CIRNAC-01 comment. Figure 14 of section 3.2.1.4 shows the results of the modelled and observed volumes of saline water stored in Tiri 02. They include saline water pumped from the underground mine but also include other inflows of water to Tiri 02. The following natural inflows also contribute to the volume of water stored in Tiri 02:

- Tiri 02 water surface snowmelt and rain
- Tiri 02 snowmelt and rain from the pit walls
- Natural runoff from the pit drainage area

Other sources of water, as specified in the Water Management Plan, are also occasionally pumped to Tiri 02. The following is a list of the other sources that contribute to the volume of water stored in Tiri 02:

- EWTP sludge water
- Water from Tiri 01 main and residual SP4 sumps



- Brine from reverse osmosis plant

- b) On January 26th, 2024, Agnico Eagle submitted an application to amend the NWB Water Licence to support the mining of deposits that were included in the 2014 Final Environmental Impact Statement and approved in Project Certificate No.006 issued by the NIRB in 2015. The amendment application included an updated version of the GWMP which takes into consideration the mining of additional deposits. The greater projected inflows in the Water Licence Amendment application when compared to values presented in the 2023 Annual Report is due to the inclusion of the additional deposits which are not reflected in the groundwater modelling of the currently approved mine plan.

While some of the supporting information used as part of the amendment application is present in the current GWMP, the updated version submitted with the 2023 Annual Report presents the collection, treatment, storage and discharge of saline groundwater as it pertains to the currently approved Meliadine project (submitted in accordance with Part B, Item 12 of the Licence).

CIRNAC's Reply to Agnico Eagle's Answer

CIRNAC is satisfied with the response and has no further comments.

CIRNAC 02: General Comments on the 2023 Geotechnical Inspection Report Recommendation:

(R-02) CIRNAC recommends that:

- a) The Annual Geotechnical Review include observations along the construction alignment of the waterline to Itivia Harbour, and that the inspection should specifically address any concerns regarding construction methods and implementation which may impede the flow of water. Tetra Tech identified some areas of concern that appear to be related to the construction of the discharge pipeline; however, the text was not clear in this regard.
- b) In future geotechnical reports, a more appropriate base map should be used for the Tailings Storage Facility (TSF). The current base image is dated and does not represent current site conditions in the area around the TSF.
- c) Future inspection reports should provide the cross-section profiles for the TSF with both the major and minor axes. The TSF's cross-section profiles only included one orientation, the minor axis cross-sections, which is not consistent with normal industry standards.
- d) Agnico Eagle provides some clarification on when monitoring concerns become either actionable rehabilitation or repair items. In addition, Tetra Tech should advise



Agnico Eagle on what work is required to address low-priority items that have become higher priorities.

- e) Agnico Eagle should provide a more detailed response regarding when the water in the Itivia tank farm containment structure is pumped out.
- f) Agnico Eagle provide the freshet period monitoring report on the AWAR and Bypass Road to the geotechnical inspection engineer to raise awareness of the site conditions and any potential further recommendations regarding rehabilitation and/or improvements.

Agnico Eagle's Answer

Agnico Eagle thanks CIRNAC for their comment and for acknowledging improvement with the implementation of recommendations from prior and 2023 Geotechnical Inspection report.

- a) Agnico Eagle confirms the 2024 Annual Geotechnical Report will include observations on the ongoing construction of the waterline. As per the information presented in Appendix 8 (2023 Annual Geotechnical Report Agnico Eagle Responses and Action Table) of the 2023 Annual Report, Agnico Eagle will address Tetra Tech's recommendation and construct the required culvert; construction timeline is subject to receiving authorization and permits. Agnico Eagle continues to monitor the AWAR as per the Freshet Management Plan.
Agnico Eagle also refers CIRNAC to Section 7.5 of the 2023 Annual Report, which includes information on the AWAR water quality and surface runoff monitoring. Qualified Environment Professionals (QEPs) from Kilgour and Associates (Kilgour) conducted daily environmental monitoring for the waterline construction work from July 10th to October 2nd, 2023. Monitoring included identifying any surface water runoff issues so they could be addressed in a timely manner. Kilgour will also be conducting environmental monitoring for the waterline construction in 2024.
- b) Agnico Eagle believes Figures 1, 5, 11, 14, 15 and 17 of the 2023 Annual Geotechnical report were representative of the TSF conditions in 2023 and takes note of CIRNAC's concern to ensure the aerial images used in future Annual Reports represent current site conditions.
- c) As per Agnico Eagle's responses to the 2022 Annual Report comments received through the NWB (CIRNAC-2), Agnico Eagle believes the cross sections provided comply with the requirements from the Water Licence and that they are sufficient to understand the development of the TSF. However, a north-south cross-section will be provided in the 2024 Annual Report to address CIRNAC's request.
- d) Agnico Eagle and Tetra Tech will work together to establish action criteria for recommendations.
- e) As per the Itivia Bulk Fuel Storage Facility Environmental Performance Monitoring Plan, and as mentioned in Appendix 8 (2023 Annual Geotechnical Report Agnico Eagle Responses and Action Table) of the 2023 Annual Report in response to Tetra



Tech's recommendation, water accumulated in the Itivia secondary containment is emptied regularly and discharged onto land following receipt of acceptable test results in accordance with the Water Licence. As per Part F, Item 11 of the NWB Water Licence 2AM-MEL1631, Agnico Eagle provides notice to CIRNAC inspector 10 days prior to discharging water from the Itivia Fuel Storage facility. Information on the dates and volume of water discharged from the facility is provided in the Monthly Monitoring reports to the NWB which are also sent to CIRNAC inspector. This information is also available 7.3.1.23 of the 2023 Annual Report.

- f) As per usual practice, prior to conducting the Annual Geotechnical Inspection, Agnico Eagle operations personnel meet with the Inspection Engineer to provide an update on how the AWAR and Bypass have performed during freshet. Whenever possible, Agnico Eagle personnel accompany the Inspection Engineer during the inspection of the roads.

CIRNAC Reply to Agnico Eagle's Answer

CIRNAC is satisfied with the response and has no further comments.

CIRNAC 03: Saline Water Discharge to Meliadine Lake Recommendation:

(R-03) CIRNAC recommends that in the appropriate sections of the main Annual Report, Agnico Eagle include the commitment that under no circumstances will saline water from Tiriganiaq Pit 2 or any other saline water storage be mixed with surface contact water and/or discharged into Meliadine Lake.

Agnico Eagle's Answer

Confirmation that saline water is not discharged to Meliadine Lake was addressed by the following statement in Section 3.6 of the Water Management Plan (WMP): "Water stored in the saline ponds is isolated from the surface runoff collection system (i.e., CP1 to CP6) and will thus not be discharged to Meliadine Lake". As mentioned in section 3.9.6 of the WMP, permeate water produced is the treated effluent of water passing through a semi permeable membrane and is not saline water. In 2023, TDS of the RO permeate ranged between 170 and 1500 mg/L in verification monitoring samples.

Agnico Eagle believes CIRNAC's recommendation was addressed. Information as it pertains to management of water on site is presented in the Water Management Plan, while the main Annual Report text is meant to address the annual reporting requirements, including monitoring results from the previous year.

CIRNAC Reply to Agnico Eagle's Answer

As per Agnico Eagle's commitment, saline water from Tiriganiaq Pit 2 or other saline water storage would never be mixed with surface water and/or discharged into Meliadine Lake. Therefore, future annual reports should include a statement to confirm that no saline water



has been mixed with surface water and/or discharged into Meliadine Lake during the respective reporting year.

CIRNAC 04: Impacts of Effluent Discharge on Phytoplankton in Meliadine Lake Recommendation:

(R-04) CIRNAC recommends that Agnico Eagle study the water quality issues in Lake Meliadine in more detail to expand data collection and assessment. Examples include, but are not limited to:

- a) Extending the current AEMP monitoring period (i.e., June to October instead of July to September) and increasing the frequency of water chemistry monitoring (i.e., once a week instead of once a month) to help define the factors influencing the system's productivity,
- b) Collecting oxygen profiles, turbidity data and water chemistry measurements (including dissolved organic and inorganic carbon) at depth to determine if the elevation of organic material in surface water and at depth indicates the early stages of eutrophication and the accumulation of organic material,
- c) Collecting and analyzing lake bottom sediment samples annually for trend analysis.

Agnico Eagle's Answer

As per 2023 Annual Report Answers provided to the NIRB on July 8th, 2024 (CIRNAC-3), Agnico Eagle would like to point out that the scope of the 2024 program will include the following components in addition to the annual surface water quality program and phytoplankton study in Meliadine Lake:

- sediment chemistry and benthic invertebrate community (exposure areas MEL-01 & MEL- 02; reference areas MEL-03 and MEL-05);
- small-bodied fish (Threespine Stickleback) population assessment and tissue chemistry (exposure area MEL-01; reference areas MEL-03 and MEL-04), and
- Lake Trout health assessment and tissue chemistry (exposure area MEL-01; external reference lakes Peter and Atulik).

The benthic invertebrate and fisheries studies follow the Metal and Diamond Mining Effluent Regulations (MDMER) Environmental Effects Monitoring (EEM) guidance for assessing the potential effect of effluent exposure on fish and fish habitat.

CIRNAC listed some possible examples of how the Meliadine Lake water quality program could be expanded. Below is a response to each of those recommendations.

- a) June and October are not viable options for water sampling on Meliadine Lake. Ice typically starts receding from the shoreline in mid-June, and boat access to the various study areas is not possible until the lake is free of ice. Lakes in the region



typically begin to freeze over in October, which presents health and safety risks to the field team. For these reasons, the AEMP is limited to 3 water sampling events in July, August, and September with roughly 3-4 weeks between events.

- b) Limnology profiles are completed in April, July, August, and September as per the AEMP Design Plan. Dissolved oxygen, pH, temperature, and specific conductivity readings are taken near the surface and at 1 m intervals to within 1 m of the sediment. Long-term monitoring at MEL-01 has consistently shown that surface water is well mixed based on the in-situ DO, temperature, and pH measurements. Turbidity is measured at the laboratory (ALS Environmental) from the water samples collected at mid-depth in the water column. There is no evidence of increasing turbidity in the East Basin of Meliadine (MEL-01) compared to the range of values observed during the baseline period and at the reference areas (see in figure below).
- c) Erosion and sedimentation rates in arctic lakes are low as indicated by low concentrations of TSS and low turbidity (see plots in Appendix C2 of the 2023 AEMP Report). Without a source of particulate material, sediment chemistry has remained relatively consistent from baseline through early operations. Sediment sampling is scheduled for August 2024. If there is evidence of increasing temporal trends for metals of interest linked to activities at the Mine, more frequent (annual) sediment sampling may be conducted.

Agnico Eagle has also committed to water sampling at additional reference lakes over 3 years starting in 2025 through the 2024 Water Licence Amendment process (commitment WLA-05 in response to KivIA-TC-03 and ECCC-TC-15).

CIRNAC Reply to Agnico Eagle's Answer

Regarding R-04(a), CIRNAC agrees with Agnico Eagle's assessment that June sampling could be difficult. However, extending the sampling period to October should be possible. Moreover, CIRNAC reiterates that increasing the frequency of water chemistry monitoring (for example, once a week instead of once a month) is critical to help define the factors influencing the system's productivity.

CIRNAC 05: Water Quality Predictions

Recommendation:

(R-05) CIRNAC recommends that Agnico Eagle provide the following:

- a) The Water Balance and Water Quality Modelling (WBWQM) figures showing concentrations during operations, closure and post-closure,
- b) Clarification on the differences in predicted CP1 TDS concentrations between the 2024 Amendment Application and the 2023 Annual Report from 2024 to 2028.



Agnico Eagle's Answer

- a) Agnico Eagle provided updates of the Water Balance and Water Quality forecast as per the requirements of the NWB Water Licence. On January 26th, 2024, Agnico Eagle submitted an application to amend the NWB Water Licence to support the mining of deposits that were included in the 2014 Final Environmental Impact Statement and approved in Project Certificate No.006 issued by the NIRB in 2015. The amendment application included an updated version of the WBWQM which accounts for the mining of additional deposits.

The water balance and water quality model developed for the Water Licence Amendment also includes a simulation of the water balance and quality during mine closure and post closure. Pending the Meliadine Water License No. 2AM-MEL1631 Amendment Application is approved, Agnico Eagle will transition to the WQWQM developed for the Water Licence Amendment. The subsequent annual reports will then include longer term water quality prediction for operation, mine closure and post closure.

- b) Regarding the differences in predicted TDS concentrations between Appendix 4 of the Meliadine 2023 Annual Report and those presented Meliadine Water License No. 2AMMEL1631, Amendment Application, 23 February 2024), it is important to note that the water balance and water quality model for the Water Licence Amendment are considering new mine components, such as the F Zone, Wesmeg, Pump, and Discovery deposits for which the mining suggests reduced TDS generation.

Further, Agnico Eagle wishes to emphasize that the increase of predicted TDS concentrations during the winter months are associated to cryo-concentration and should not be compared to observed TDS values over the open water period. During the open water period, the 2023 Annual Report predictions of TDS concentration are conservative and in an acceptable range of error when compared to observed concentrations.

CIRNAC Reply to Agnico Eagle's Answer

CIRNAC is satisfied with the response and has no further comments.

CIRNAC 06: Sludge Disposal Recommendation:

(R-06) CIRNAC recommends that Agnico Eagle:

- a) Provide data collected on TIRI02 water quality for comparison to the sludge water quality data,



- b) Provide the Scenario Analysis report on alternative sludge management studies for review.

Agnico Eagle's Answer

As per 2023 Annual Report Answers provided to the NIRB on July 8th, 2024 (ECCC-3), Agnico Eagle will continue its efforts of investigating in-pit sludge disposal potential impacts, interpretation of monthly sludge sampling results and potential alternative sludge management options and results of this investigation will be presented in the 2024 Annual Report.

CIRNAC Reply to Agnico Eagle's Answer

Regarding R-06(a), in the 2023 Annual report, TIRI02 water quality data were only provided for total dissolved solids (TDS), total ammonia and radium-226 in Figures 15, 16 and 17 of the main report and Appendix 4. However, Agnico Eagle claimed that the sludge is unlikely to negatively impact the pH, conductivity, total ammonia, copper, lead, nickel and zinc in saline contact water based on existing water quality data collected in TIRI02. Agnico Eagle did not provide the requested additional water quality data for TIRI02 in their response. Therefore, CIRNAC could not confirm Agnico Eagle's conclusions that sludge placed in the pit is unlikely to negatively impact the water quality in TIRI02.

Regarding R-06(b), CIRNAC looks forward to reviewing the Scenario Analysis report on alternative sludge management studies in the 2024 Annual Report.

CIRNAC 07: Improvements to Annual Report

Recommendation:

(R-07) CIRNAC recommends that:

- a) Agnico Eagle's annual reports include a longitudinal cross-section through the TSF that shows the status of both cells of the TSF at year-end,
- b) Agnico Eagle's annual reports include information on water consumption by major category (e.g. camp, paste plant, Mill, etc.),
- c) The document control record of the Water Management Plan identifies any revisions made to any of the three plans included as appendices,
- d) Agnico Eagle explains why the Roads Management Plan was not updated in 2023 to include waterline-related activities and infrastructure along the All-Weather Access Road (AWAR) in 2023 and
- e) Appendix 4 should be renamed to include references to Figures.

Agnico Eagle's Answer

- a) Agnico Eagle refers CIRNAC to answer provided to CIRNAC-2 c) above.
- b) As per Agnico Eagle's response to CIRNAC comment on the 2022 Annual Report (refer to Appendix 38 of the 2023 Annual Report), Agnico Eagle reiterates that the information required by the Water Licence is provided in the Annual Report. Agnico



Eagle remains available to discuss with CIRNAC about the additional information they require.

- c) Agnico Eagle thanks CIRNAC for acknowledging improvements made to Document Control sections of Management Plans. The Plans included in Appendix of the WMP each have their own Document Control section identifying changes made to the documents. However, to address CIRNAC's concern, Agnico Eagle will indicate in the WMP Document Control Section if the appended plans were revised in future updates of the WMP.
- d) The Roads Management Plan was updated and submitted in March 2022 (Version 9) to NIRB in compliance with the revised Term and Condition 125, per Project Certificate No. 006 Amendment 002 and as indicated in the Document Control section of the Plan. Version 9 of the Roads Management Plan included revisions to numerous Sections of the Plan, as mentioned by CIRNAC, to reflect operational changes related to the construction and operation of the waterlines. While the Plan was not submitted with the 2022 Annual Report, it was made available to Parties through its submission to NIRB. The Plan was not updated in 2023, and the subsequent 2024 update (Version 10) was submitted with the 2024 Annual Report. Details of this update are provided in the Document Control section of the Plan. Updates to the Plan are not required on an annual basis, but as necessary. Agnico Eagle will ensure plans updated throughout the year are submitted with the Annual report.
- e) Agnico Eagle agrees with CIRNAC's recommendation, and this will be addressed in the 2024 Annual Report.

CIRNAC Reply to Agnico Eagle's Answer

Regarding R-07(b), Agnico Eagle should proactively report any significant changes in water consumption by major category (e.g. camp, paste plant, Mill, etc.) and provide details as requested/required.