



July 27<sup>th</sup>, 2022

Emily Koide  
Technical Advisor I  
Nunavut Impact Review Board  
P.O. Box 1360 Cambridge Bay  
Nunavut NU X0B 0C0

**RE: Opportunity to Address Comments Received for Agnico Eagle Mines Limited's  
*Meliadine Gold Mine Project 2021 Annual Report***

Dear Mrs. Koide,

Agnico Eagle Mines Limited thanks the Nunavut Impact Review Board (NIRB) for the opportunity to address comments received for Agnico Eagle Mines Limited's Meliadine Gold Mine Project 2021 Annual Report.

The following information and comments are intended to address comments outlined in the below referenced letters.

220620-11MN034-ECCC Comments on 2021 Annual Report-IT7E  
220620-11MN034-CIRNAC Comments on 2021 Annual Report-IT7E  
220620-11MN034-GN Comments on 2021 Annual Report-IT7E  
220620-11MN034-KIA Comments on 2021 Annual Report-IT7E  
220620-11MN034-TC Comments Re 2021 Annual Report-IA1E  
220620-11MN034-DFO Comments on 2021 Annual Report-IT7E  
220620-11MN034-SDFN NDFN Comments on 2021 Annual Report-IA2E

Should you have any questions or require further information, please do not hesitate to contact us.

With my best regards,

A handwritten signature in blue ink that reads "Sara Savoie".

Sara Savoie  
sara.savoie@agnicoeagle.com  
819-759-3555 x 4603212  
Environment General Supervisor



## Environment and Climate Change Canada (ECCC)

### **ECCC-1 Radium-226 Units**

#### Comment

Units shown for Radium-226 are mg/L rather than the standard Bq/L, in the following:

- Annual Report Section 3.2 – Figure 17. Forecasted versus observed radium concentrations in TIRI02
- Appendix 5 – Table 4

#### ECCC Recommendation(s)

Confirm the units for Radium-226 as Bequerels/liter (Bq/L) or provide the conversion done.

#### Agnico Eagle Answer

The units for Radium-226 shown in Appendix 5 – Table 4 were mistakenly identified as mg/L. The values presented are indeed in units of Bq/L.

### **ECCC-2 Ammonia and Total Phosphorus in CP1**

#### Comment

The updated model results indicate that ammonia (NH<sub>3</sub>) and total phosphorus (TP) were over-predicted in comparison to observed levels in CP1. The annual report noted that further investigation was required to identify whether nutrient attenuation is occurring due to algal growth in CP1. The 2021 AEMP documented higher chlorophyll-a in near-field and mid-field exposure areas, which may be consistent with nutrient export from CP1, but would not be consistent with lower levels in CP1. Further review to identify the reasons for the differences between modeled and observed concentrations is warranted.

Figure 11 in Appendix 5 shows comparisons of observed vs forecasted phosphorus concentrations. There are no under-ice sample data points which would validate the predicted spikes in TP concentrations due to cryoconcentration and/or internal recycling of phosphorus. Consideration could be given to conducting limited winter sampling to identify TP levels under ice to validate the range of predictions.

#### ECCC Recommendations(s)

ECCC recommends review of the modeling for ammonia and total phosphorus in CP1 to identify the source of the discrepancy in observed vs predicted concentrations, and that consideration be given to validating under-ice predictions.



### Agnico Eagle Answer

In their comment, ECCC states that higher chlorophyll-a – documented in the 2021 AEMP by Agnico Eagle – may be consistent with nutrient export from CP1, but not consistent with lower [nutrient] levels in CP1. However, Agnico Eagle believes an increase in algal production in CP1 may result in higher chlorophyll-a in the receiving environment and be consistent with lower nutrient levels in CP1 for the following reason. Agnico Eagle hypothesizes that algal growth in CP1 may be responsible for the attenuation (i.e. reduction in concentration) of ammonia (NH<sub>3</sub>) and total phosphorus (TP) in CP1, as the nutrients would undergo metabolic alteration for algal energy production and thus a water quality analysis would result in lower detectable concentrations of NH<sub>3</sub> and TP after they have been consumed by algae. Although this would result in increased chlorophyll-a in the receiving environment, it would also result in the reduction of detectable NH<sub>3</sub> and TP in CP1. As algal growth is not a modeled component of the Water Balance and Water Quality Model (WBWQM), the nutrient levels in CP1 would subsequently fall lower than model predictions under this hypothesis.

Agnico Eagle acknowledges the recommendation by ECCC and consideration will be given to the recommendation and Agnico Eagle will assess how best to account for it in future annual reports.

### **ECCC-3 Definitions for IC25 and QA/QC Blanks**

#### Reference(s)

Appendix 32-1 AEMP Design Plan

- o List of Abbreviations
- o Section 5.1.5 Quality Assurance/Quality Control

#### Comment

IC25

The IC<sub>p</sub> is the inhibiting concentration for a specified percent effect, such as a 25% reduction in growth. The definition for IC25 provided should be corrected from “inhibition concentration affecting 25% of tested organisms” to “effluent concentration that causes a 25% inhibitory effect in the sublethal endpoint being measured”. The definition provided is for EC25 rather than IC25.

QA/QC  
Errata note: The descriptions of travel and field blanks in the AEMP Design QA/QC section on page 44 have been transposed and should be corrected.

#### ECCC Recommendations(s)

ECCC recommends revising the definitions as noted, for clarity.

### Agnico Eagle Answer

The definition of the IC25 has been updated as requested, the modification will be included for the final version of the AEMP Design Plan.



The descriptions of the travel, field, and equipment blanks on page 44 of the AEMP Design Document were adapted from the BC Field Sampling Manual (2013) and the Protocol Manual for Water Sampling in Canada (CCME, 2011). A description of each blank is provided in response to ECCC-4.

## **ECCC-4 QA/QC Blanks**

### Reference(s)

Appendix 18 AEMP Report – Section 4.4.5 Quality Assurance and Quality Control

### Comment

Water chemistry QA/QC included “Six deionized water blanks (DI) and three equipment blanks...”

It is not clear whether the blanks included travel blanks or were all field blanks, which would make a difference for the samples showing the presence of analytes and the subsequent conclusions to be drawn.

### ECCC Recommendation(s)

ECCC recommends that the Proponent clarify the use of QA/QC blanks, noting the different purposes between field and travel blanks.

### Agnico Eagle Answer

The three types of blanks collected as part of the water quality QC assessment are:

- Travel Blanks – Travel blanks, or trip blanks, consist of de-ionized (DI) water provided in sampling bottles by ALS and receive the same treatment as field samples during shipment, handling, storage, and laboratory analysis. Trip blanks are meant to detect any widespread contamination resulting from the container (including caps) and preservative during transport and storage. Travel blanks should (1) be included in sample container shipments, (2) come directly from the analytical laboratory and (3) be stored in a cool place (e.g., refrigerator).
- Field Blank (*aka deionized water blank [DI blank]*) – Laboratory-supplied deionized water is poured directly into the sample bottles. Field blanks are used to detect potential contamination caused by from bottles, collection methods, the atmosphere, and preservatives. The field blank mimics the water sample except the deionized water does not come in contact with the sampling device (pump and tubing in the winter and Kemmerer during the open water season).
- Equipment Blanks – At the beginning or end of a field sampling episode, after routine rinsing of the pump and tubing or Kemmerer, distilled water is run through the equipment



and placed in sampling bottles for analysis of a wide suite of parameters (e.g., metals, nutrients, and major ions). This sample tests for possible cross-contamination of samples from the water sampling equipment.

Travel blanks are recommended for the AEMP, but in 2021, none of the sampling events included travel blanks, this will be addressed during the 2022 AEMP sampling season.

## **ECCC-5 Low Action Levels – Phytoplankton Assessment Criteria**

### Reference(s)

Appendix 32-1 AEMP Design – Table 8-2 Proposed Low Action Levels for Toxicological Impairment for Meliadine Lake

### Comment

The first part of the Phytoplankton Assessment Criteria is “Phytoplankton community metrics at the Near-field area beyond the range of baseline/reference conditions”

For toxicological impairment, most of the metrics would demonstrate a lower value (e.g. density and biomass), but using the descriptive term “beyond” implies higher. This should be clarified by describing the trigger as “below” or “outside” the range of baseline/reference conditions.

Footnote (c) is missing for this table.

### ECCC Recommendations(s)

ECCC recommends revision of the assessment criteria statement to specify “below” or “outside” rather than “beyond” the range of baseline/reference conditions and that footnote (c) be completed.

### Agnico Eagle Answer

Agnico Eagle agrees with ECCC’s recommendation. The assessment criteria was revised to state “outside the the range of baseline/reference conditions”.

Footnote (c) has been updated to correctly cross-reference Table 5-11 that lists the endpoints that are included in the fish health assessment. The reference to tissue chemistry was removed from this footnote because the assessment criteria for “Fish Usability” is discussed in the last row of Table 8-2. The changes will be applied for the final AEMP Design Plan.



## **ECCC-6 Proposed Action Levels for Nutrient Enrichment Hypothesis**

### Reference(s)

Appendix 32-1 AEMP Design – Table 8-3 Proposed Action Low Action Levels for Nutrient Enrichment for Meliadine Lake

### Comment

In order to meet the Low Action Level for Water Quality, the following three conditions are proposed to have to exist:

- Concentrations of TP in the Near-field area above the normal range, supported by temporal trends AND
- A statistically significant relative difference between the Near-field area and Reference for TP AND
- Lake-wide average phosphorus concentration exceeds 75% of AEMP Benchmark

Considering the extent and volume of Meliadine Lake, the third condition would almost certainly never be measured, and to be met would entail an increase of significant magnitude in TP loadings and ensuing concentrations. The AEMP Benchmark has been set at 0.010 mg/L TP to reflect the upper bound of the oligotrophic status, and the Action level trigger would be 0.0075 mg/L TP. A more timely and realistic trigger condition would be on the basis of near-field rather than lake-wide change.

### ECCC Recommendations(s)

ECCC recommends amending the third condition by replacing “lake-wide” with “near-field”.

### Agnico Eagle Answer

The AEMP Action Level for phosphorus will be applied to the near-field area. However, Agnico Eagle wants to emphasize that phosphorus concentrations are only one line of evidence used to assess nutrient enrichment caused by effluent. Increases in total phosphorus in the East Basin suggests the potential for nutrient enrichment, but any conclusions about the potential for nutrient enrichment need to be supported by more relevant lines of evidence that directly assess phytoplankton productivity, namely total biomass and chlorophyll-a concentrations.

## **ECCC-7 Tissue Chemistry – Threespine Stickleback**

### Reference(s)

Appendix 18 AEMP Report

### Comment

Fish tissue results from MEL-01 in 2021 documented higher concentrations of calcium, arsenic, manganese, strontium, and uranium in Threespine Stickleback compared to the reference areas and compared to baseline tissue chemistry results from 2015. Arsenic, manganese and strontium were also higher in sediments in 2021 than in 2018, and arsenic, strontium and uranium concentrations have increased in water in the east basin of Meliadine Lake since baseline. While



none of these parameters triggered action levels, the potential increasing trend in water, sediments, and fish tissue should be tracked in future monitoring and a weight-of-evidence approach used to assess cause and overall effects.

#### ECCC Recommendation(s)

ECCC recommends continued monitoring and evaluation of parameters that are showing consistent increases in biotic and abiotic components of the Meliadine Lake ecosystem.

#### Agnico Eagle Answer

Chemistry analysis in sediment fish tissue is part of the AEMP Design Plan. The next monitoring program is scheduled for 2024 (3-year monitoring cycle).

### **ECCC-8 Acid Rock Drainage**

#### Reference(s)

Annual Report Section 4.2.4 Filtered Tailings ARD Potential

#### Comment

Proponent states, despite the uncertain classification of the majority of the tailings samples over the 2019-2021 period, Agnico Eagle does not consider the tailings to pose an ARD risk for the site, for the following reasons:

- the tailings are being stored in a facility that will freeze back (i.e. re-develop permafrost) and inhibit water movement within a few years post-operations;
- placement of the tailings includes compacting by a vibrator packer and sloping to shed water off the facility, which will lower oxygen diffusion into the tailings and limit water contact, both established mechanisms to reduce ARD;
- there is enough carbonate in the tailings that ARD may never occur as the actual ratio that ARD onset is expected is much closer to 1.0;
- if ARD could develop, permafrost freeze back will occur before (at least one hundred years before) the onset of ARD due to the amount of carbonate in the tailings and arctic climate slowing reaction rates. The late potential onset of acidic conditions is based on the slow oxidation rate of sulphides, and therefore slow rate of neutralization consumption of carbonates and if slow enough, silicate neutralization. While tailings may be classified as uncertain, they still contain enough carbonate to neutralize the acidity produced until many decades after operations have ended. Furthermore, it is also worth noting that the analytical laboratory completed an investigation showing that past carbonate analyses were biased low (section 3), meaning that there is more carbonate than previously shown, which would only extend the delay to consumption of carbonate; and
- progressive reclamation is a part of the facility management for closure, meaning a cover will be placed over most of the tailings before the mine ceases operations.

As was noted in ECCC's 2020 annual report comments, ECCC continues to express its concerns regarding the proponent's conclusion that "Despite the uncertain classification of the majority of the tailings samples over the 2019-2021 period, Agnico Eagle does not consider the tailings to



pose an ARD risk for the site “. Samples classified as uncertain, reflects lack of enough neutralization potential.

#### ECCC Recommendations(s)

Recommends that the proponent implement a monitoring plan to verify its conclusion on filtered tailing classified as uncertain.

#### Agnico Eagle Answer

Agnico Eagle thanks ECCC for their comment related to filtered tailings ARD potential.

Agnico Eagle would like to reiterate the fact that the *uncertain* classification indicates that there is an uncertain chance that the tailings samples in question have the potential to produce ARD. This classification of uncertain potential is also for sulphidic material that is in a fully oxygenated atmosphere and above freezing conditions. Despite the uncertain classification of tailings samples, physical drainage remains a key component to ARD. As such, management of the tailings in a dry, compacted, and frozen facility will ensure that the potential of these tailings to produce ARD is inhibited, and subsequently will not pose an ARD risk for the site. The progressive covering of the tailings during operations, limited oxygen availability, and low potential for contact with water further mitigate conditions for ARD generation. Furthermore, it should be noted that during early mining operations, some of the highest grade material was targeted, which would also result in ore with highest sulphur content being processed. In 2021, filtered tailings ARD potential decreased compared to previous years. It is expected that this decreasing trend will continue as the mine develops, and lower grade material from underground, but notably the open pits is processed.

Several monitoring programs are in place at Meliadine related to filtered tailings ARD potential, which are detailed in the 2021 Annual Report and summarized below.

Tailings freeze-back is monitored monthly through the four (4) thermistors installed in 2019. The 2021 data indicates that tailings material monitored by the thermistors were generally frozen by December 2021. Temperatures in the original ground below the TSF were continuously below 0°C throughout 2021. Figures displaying the GTC data from the various TSF thermistors are located in Appendix I of the 2021 Geotechnical Inspection Report (Appendix 6 of the 2021 Annual Report). Thus, ground temperature monitoring data collected in 2021 supports the statement above, that the tailings are being stored in a facility that has frozen back (i.e. re-develop permafrost) and inhibit water movement within a few years of placement. As stated above, this will have the effect to slow the reaction rates and to limit the ARD risk related to the *uncertain* classification of the filtered tailings.

In addition, routine visual geotechnical inspections of the TSF are carried out on a weekly basis as per the Mine Waste Management Plan. Filtered tailings geochemical sampling is carried out bi-monthly and results are reviewed internally as they become available to ensure there is no risk to the receiving environment.

Surface water in contact with the TSF is collected in Containment Ponds 1 and 3 (CP1 and CP3). Water quality in CP1 and CP3 (and in other containment ponds) is monitored on a monthly basis as per the Type A Water Licence during the open water season. This monitoring will allow the



identification of trends in water chemistry (acidity, metals and other parameters), if any, that could potentially indicate a change in ARD/ML conditions of the TSF.

The geotechnical, geochemical and surface water quality monitoring programs described above are ongoing at Meliadine and will be reported in future annual reports as per usual practice.

## **ECCC-9 Dustfall**

### Comment

The second paragraph of page 99 begins with the statement: "For AWAR and By-Pass Road transects (DF-1, DF-2, DF-3, and DF-WT, summer-only sampling), overall rates of dustfall were lower than ever observed previously, despite similar or increased traffic in 2021." The Proponent acknowledges that sampling later in the season than previously (into October) may have reduced average rates due to effects of snow cover. However, there is no acknowledgement that the heavier precipitation for the 2021 summer season (JJA total of 147.7 mm at Rankin Inlet Airport) vs. the 2020 summer season (JJA total of 44.9 mm) may have also been a factor in the reduced rate of dustfall.

### ECCC Recommendation(s)

ECCC requests that the Proponent assess the impact of the heavier 2021 summer precipitation on the reduced rate of dustfall.

### Agnico Eagle Answer

Agnico Eagle appreciates and agrees with ECCC's comment that precipitation may have also influenced road dust generation in 2021. Agnico Eagle understands that in fact, many environmental factors such as precipitation, temperature, and wind speed can influence rates of fugitive dust, in combination with use scenarios, road material, and dust suppressant application. For clarity, the objective of this report with regards to road dust is to document current conditions and trends in measured dustfall, and indicate the best management practices that are in place to help minimize dust generation. While a basic commentary on potential reasons for observed trends is provided, Agnico Eagle notes that rates of dustfall are assumed due to a complex interaction of the above-mentioned factors. These factors have well-established relationships used in air quality modelling, and any validation of those relationships is beyond the scope and design of this monitoring program.

Nevertheless, Agnico Eagle has conducted a basic review of summer precipitation rates in relation to dustfall results since 2019 when roadside transect sampling began. Precipitation recorded by the Rankin Inlet weather station was reviewed, since automated precipitation monitoring didn't begin at Meliadine until 2020. As ECCC indicates in their comment, total summer precipitation in 2021 was greater than 2020 (Table 1), which in isolation would lead to a reduction in fugitive dust year-over-year. However total precipitation in 2019 was greater than 2020 and 2021, yet measured average dustfall was not lowest in 2019 (Figure 1), indicating that, as would



be expected and discussed above, other factors also have an important impact on dust generation.

Agnico Eagle will continue to apply dust suppressant and other best management practices to control fugitive dust along the AWAR in accordance with the Road Management Plan, and will continue to document and report rates of dustfall according to the Air Quality Monitoring Plan.

Table 1. Monthly total precipitation (mm) at the Rankin Inlet A weather station.

Month	2019	2020	2021
June	27.2	4.8	14.1
July	112.8	7.6	73
August	112.9	32.5	60.6
<b>Total</b>	<b>252.9</b>	<b>44.9</b>	<b>147.7</b>

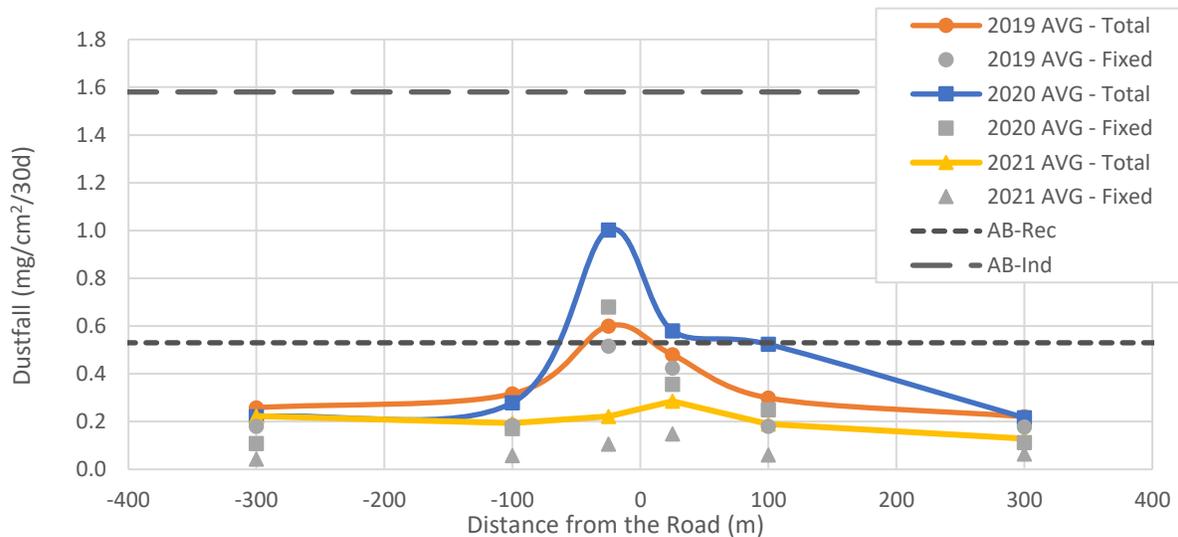


Figure 1 (Figure 22 in the 2021 Air Quality Monitoring Report). Average 30-day-normalized rates of total and fixed dustfall for summertime sampling transects DF-1, DF-2, and DF-3 along the Meliadine AWAR. Symbols represent average measured dustfall across transects and sampling dates (2-3 consecutive 30-d periods) within each year. Negative values represent the west (upwind) side of the road. Dashed lines indicate the Alberta Ambient Air Quality Guideline for recreational and industrial areas.

## ECCC-10 Relative Humidity

### Reference(s)

Appendix 24: 2021 Air Quality Monitoring Report, APPENDIX B: DAILY AVERAGE WEATHER DATA



### Comment

Relative humidities appear to be biased on the high side at the Meliadine meteorological station. For example, on July 19, 2021, the average relative humidity is calculated at 87%. In comparison, the relative humidity at the Rankin Inlet Airport weather station averages 60% on this day despite its closer proximity to Hudson Bay, and both stations reporting moderate northwesterly winds.

### ECCC Recommendation(s)

ECCC recommends that the Proponent perform a quality assurance of the relative humidity data.

### Agnico Eagle Answer

Upon review, values presented in Appendix B of the 2021 Air Quality Monitoring Report are maximum daily relative humidity, rather than average as indicated in the table caption. Average daily relative humidity is not specifically recorded by the Meliadine weather station. Agnico Eagle appreciates ECCC's thorough review and assistance in identifying this error and will ensure this is corrected in future annual reports.



## Government of Nunavut (GN)

### **GN-01: Road Management Agreement**

#### Comment

NIRB Project Certificate No. 006, Term and Condition # 48 requires the development of a road management agreement and states that:

“The Road Management Agreement shall include the following specific measures:

- ...A no-shooting zone (1 km wide) on either side of the road should be established as a condition of public access to the AWAR and compliance with this Agnico Eagle policy should be monitored and reported by the Proponent.
- All incidents of hunting involving shooting along or across the AWAR should be reported by the Proponent to the GN.
- During periods when large aggregations of caribou are detected near the Project, harvest monitoring intensity should be increased to ensure that levels of caribou harvesting are properly documented.”

The reporting requirements under this Term and Condition state that:

“...monitoring results as well as any subsequent updates to the Plan, reported and discussed in the Proponent’s Annual Report to the NIRB.”

The GN notes that results from the monitoring of caribou harvesting along the AWAR are not reported in the Proponent’s 2021 Terrestrial Effects Monitoring and Mitigation Program Annual Report (AEM 2022) or elsewhere in the Project’s 2021 Annual Report (AEM 2022). The Proponent is required to (a) monitor and report compliance with the no-shooting zone policy for the AWAR, (b) have “dedicated road monitors” and (c) increase harvest monitoring along the AWAR during periods when large aggregations of caribou are present. None of this information or data is presented in the Annual Report. Therefore, compliance with Term and Condition 48 cannot be assessed by the GN.

Although the required Road Management Agreement has been developed by the Proponent (AEM 2022, Section 10.2), implementation of this agreement and its effectiveness cannot be evaluated since the 2021 Annual Report and its appendices do not present or analyze any of the necessary monitoring data. The agreement itself, and Term and Condition 48 of the Project certificate, require the reporting of these data. The Annual Report should contain the following:

1. Reporting of compliance with the 1 km no-shooting zone either side of the AWAR including presentation and analysis of the monitoring data used to assess compliance with this policy.
2. A summary of incidents involving shooting across or along the AWAR, and any trends in these incidents since the AWAR entered operation.
3. Information on the number of dedicated roads monitors tasked with monitoring harvesting along the AWAR.



Evaluating whether the AWAR's Road Management Plan is being properly implemented is an essential part of the Project's monitoring scheme. This deficiency in the Annual Report, and non-compliance with the reporting requirements of Term and Condition 48, should be addressed.

A summary of caribou harvest activity was collected through the Hunter Harvest Study (HHS), as described in Section 13 of the 2021 Terrestrial Effects Monitoring and Mitigation Program Annual Report (AEM, 2022) and detailed in Appendix G of the TEMMP (AEM, 2022). In accordance with the TEMMP, threshold levels for the Caribou harvest are to be set after three full years of data from the HHS, which will be after data collected in 2023.

The GN appreciates the level of effort put into the HHS and looks forward to increased data gathering and participation over 2022 and 2023 seasons.

#### Recommendation(s)

The GN requests a response to this issue in a comprehensive manner. Accordingly, the GN recommends the following:

1. That the Proponent revise the 2021 Annual Report to include the following, in relation to Term and Condition #48 and the Road Management Agreement (AEM 2022, Section 10.2):
  - a. Reporting of compliance with the 1 km no-shooting zone either side of the AWAR including presentation and analysis of the monitoring data used to assess compliance with this policy.
  - b. A summary of incidents involving shooting across or along the AWAR, and any trends in these incidents since the AWAR entered operation.
  - c. Information on the number of dedicated road monitors tasked with monitoring harvesting along the AWAR.
  - d. Information demonstrating that caribou monitoring and caribou harvest monitoring along the AWAR was increased during periods when large aggregations of caribou (> 50 animals) were observed in the vicinity of the road (i.e., specific data on caribou group observations being linked to increased monitoring effort as required under the Road Management Agreement).
2. If harvest monitoring is taking place using other methods, it should be clearly stated that the aforementioned measures are no longer being used.

#### Agnico Eagle Answer

Agnico Eagle thanks the GN for their comment and wishes to clarify that communications relative to the 1km no-shooting zone are made prior to the migration through various communication channels, namely through meetings with community members, facebook posts and radio communications. As an example and as reported in section 3 of the 2021 TEMMP report, a meeting with Rankin Inlet Elders specifically focused on the no-shooting rules on May 31st, 2021.

To Agnico Eagle's knowledge, there was no incidents involving shooting across or along the AWAR in 2021, Agnico Eagle will make sure to add information on whether or not there were incidents involving shooting across or along the AWAR in future annual reports.

As per road monitors, in 2021, due to concerns about the COVID-19 pandemic, adaptive measures were taken to avoid contacts between community members and Agnico Eagle



employees. KHTO let convoys when travel was required on the AWAR during the caribou migration and the Environmental Department and its third-party contractor ERM monitored caribou presence and harvesting as per the caribou migration protocol which determines the level of monitoring to conduct according to caribou presence.

Agnico Eagle will add details on harvest monitoring in future annual report as recommended by the GN.

## **GN-02: Roads Management Plan**

### Comment

NIRB Project Certificate No. 006, Term and Condition (TC) # 54 states that the Proponent shall ensure that road safety barriers or berms associated with Project infrastructure, all-weather access road and associated roads/trails are constructed for the safe passage of wildlife while separating public road use with Project-related mine traffic.

While this information is presented in the Proponent's Roads Management Plan (Agnico Eagle Mines Limited-Meliadine Division March 2022), the reporting requirements are not met as they state that a summary discussion shall be provided in the Proponent's Terrestrial Environment Management and Monitoring Plan (TEMMP).

The Proponent notes that Section 4.3 in the TEMMP refers to TC 54, however this section does not refer to any safety barriers or berms but rather discusses wildlife road surveillance monitoring.

Barriers and berms are considered mitigation measures to reduce impacts on wildlife from existence of roads. Their use was proposed as part of TC # 54 to ensure Project infrastructure does not prevent or unduly limit the movement of caribou and other terrestrial wildlife. An analysis of the implementation of barriers and berms and their effects on wildlife should be included in the Annual Report in order to measure overall Project effects.

### Recommendation(s)

The GN offers the following recommendations with respect to this issue:

1. Report where road safety barriers or berms are associated with Project infrastructure, all-weather access road and associated roads/trails are used.

### Agnico Eagle Answer

Agnico Eagle thanks the GN for their comment and will include information on where road safety barriers or berms are associated with Project infrastructure, all-weather access road and associated roads/trails are used in future annual reports.



## **GN-03: TERRESTRIAL ENVIRONMENT MONITORING SUMMARY REPORT**

### Comment

NIRB Project Certificate No. 006, Term and Condition #55 states that the Proponent shall set thresholds for the direct mortality of wolf, grizzly bear, polar bear, wolverine, and fox. In addition, the Proponent shall reach an agreement with the appropriate Designated Inuit Organization regarding compensation or any direct mortality of wildlife resulting from the Project's activities.

The TEMMP suggests the following thresholds for mine-related mortality

“no more than 1 caribou, 20 Arctic foxes, 1 waterfowl and 1 upland bird, per year”;

and vehicle collisions

“no more than 1 caribou/year.”

There are no set thresholds for wolves, grizzly bears, polar bears, or wolverines. Compensation or agreements with the appropriate Designated Inuit Organization are not discussed either.

Thresholds signal when adaptive management and TEMMP refinements should take place. They guide the required wildlife monitoring and set a limit which should not be exceeded. Without clear thresholds for the mortality of wolves, grizzly bears, polar bears and wolverines no adequate adaptive management measures are set for these species. Compensation for the loss of wildlife as a result of Project activities should be included within the annual monitoring report as it is Agnico Eagle's responsibility to prevent wildlife mortality to the best of their abilities. Consultation with the Inuit communities on compensation allows local knowledge to be incorporated and for community members to assess how Agnico Eagle is doing at reducing the effects on wildlife.

### Recommendation(s)

The GN offers the following recommendations with respect to this issue:

1. Thresholds for wolves, grizzly bears, polar bears, and wolverines shall be set within the Proponent's TEMMP Report with adequate adaptive management measures.
2. Discussion and consultation on the compensation of wildlife mortality resulting from the Project's activities shall be reported in the TEMMP.

### Agnico Eagle Answer

1. Agnico Eagle thanks the GN for their comments and would suggest further discussing thresholds within the Terrestrial Advisory Group (TAG) setting.
2. As per wildlife mortalities and incidents, they are reported in section 9.5 of the TEMMP annual report and the related compensation of wildlife mortality resulting from the Project's activities is determined in Appendix 6.1 of the Inuit Impact & Benefit Agreement (IIBA).



## **GN-04: TERRESTRIAL ENVIRONMENT MONITORING SUMMARY REPORT**

### Comment

NIRB Project Certificate No. 006, Term and Condition (TC) # 56 states that the Proponent shall report:

- a. Description of all updates to terrestrial ecosystem baseline data;
- b. A description of the involvement of Inuit in its monitoring programs;
- c. A detailed presentation and analysis of the distribution relative to Project infrastructure and activities for caribou and other terrestrial mammals observed during surveys and incidental sightings;
- d. Results of the annual monitoring program, including field methodologies and statistical approaches used to support conclusions drawn; and
- e. An assessment and presentation of annual environmental conditions including timing of snowmelt, green-up, as well as standard weather summaries.

The Terrestrial Environment Management and Monitoring Plan (TEMMP) states that an annual Terrestrial Environment Monitoring Summary Report will include all of the above information.

However, information on the assessment of annual environmental conditions, specifically the timing of green-up is absent from the Annual Report.

Comparison of monitoring results year over year requires relevant environmental conditions such as timing of green-up and standard weather summaries to account for temporal fluctuations in wildlife movement and activity. Without this information, differences in wildlife activity year over year may all be associated with project activities if there is no mechanism to correct for environmental fluctuations.

### Recommendation(s)

The GN offers the following recommendations with respect to this issue:

1. Include information on the timing of green-up in the Annual Report.

### Agnico Eagle Answer

Agnico Eagle thanks the GN for their comment and will include this information in future annual reports.

In 2021 and 2022, the green-up dates are estimated to be June 31<sup>st</sup> and June 21<sup>st</sup>, respectively, based on pictures taken at the Mine site.



## **GN-05: WILDLIFE ENVIRONMENTAL AWARENESS TRAINING - BIRDS**

### Comment

NIRB Project Certificate No. 006 Term and Condition #58 states that the Proponent shall ensure all employees working at Project sites receive awareness training regarding the importance of avoiding known nests and nesting areas and avoiding large concentrations of foraging and moulting birds.

While the Terrestrial Environment Management and Monitoring Plan (TEMMP) states that employees will receive wildlife environmental awareness training, including species identification, wildlife behavior, wildlife encounters and deterrents, no specific mention on nest avoidance is stated in the Wildlife Protection and Response Plan in Appendix III.

To prevent and minimize impacts on migratory birds and their nests, avoidance of active nests during the nesting period is a mitigation measure that can only be implemented if site personnel and employees are aware of this requirement.

Information such as the distance from active nests to avoid, the types of activities prohibited near active nests and reporting requirements should an active nest be identified by site personnel is required in order to evaluate effectiveness of this measure.

### Recommendation(s)

The GN offers the following recommendations with respect to this issue:

1. Confirm that bird nest avoidance training was included in the wildlife environmental awareness training given to employees.
2. Include this information within the Wildlife Protection and Response Plan in Appendix III.

### Agnico Eagle Answer

Agnico Eagle confirms that bird nest avoidance training is included in various environmental awareness training provided to employees. As per the Wildlife Protection and Response Plan, it will be reviewed alongside the TEMMP within the TAG.

## **GN-06: CONSULTATION WITH NUNAVUT RESEARCH INSTITUTE (NRI)**

### Comment

NIRB Project Certificate No. 006 Term and Condition # 49 requires consultation with the Nunavut Research Institute (NRI) and the Proponent is encouraged to share monitoring and research study design with NRI four (4) months prior to the anticipated commencement of research activities to facilitate licensing review.



This is not reported in the Proponent's Terrestrial Environment Management and Monitoring Plan (AEM 2022), the 2021 Terrestrial Effects Monitoring and Mitigation Program Annual Report (AEM 2022) or elsewhere in the Project's 2021 Annual Report (AEM 2022).

Since none of this information or data is presented in the Annual Report, compliance with TC 49 cannot be assessed by the GN.

Excluding the NRI from study design consultation could result in missing the opportunity for a fulsome study. Any proposed monitoring and research study designs may greatly benefit from being reviewed and confirmed that all required permits are acquired. Cooperation with the NRI allows for additional community involvement and input into the Project's activities and effects on the surrounding environment.

To comply with this condition, the NRI should be consulted with the monitoring and research study design and results.

#### Recommendation(s)

To fully comply with Term and Condition # 49, it is recommended that a statement be included within the Proponent's Annual Monitoring Report if any scientific research licences were required and acquired for the annual monitoring period.

The GN recognizes that the Proponent would only need to consult with the NRI if research activities are undertaken that would trigger the requirement for a scientific research licence under the Nunavut Scientists Act.

#### Agnico Eagle Answer

Agnico Eagle thanks the GN for their comment and will account for it in future years. As per 2021, no research activities were undertaken that would trigger the requirement for a scientific research licence under the Nunavut Scientists Act.



## **Kivalliq Inuit Association (KivIA)**

### **KivIA-1 AWAR Traffic Levels**

#### **Comment**

The traffic volumes along the All-Weather Access Road (AWAR) in 2021 continue to exceed levels predicted for the AWAR in the FEIS by 115% (more than double) between June and October (S 10.3, Table 27, pg 115). Traffic volumes during July, which coincided with caribou movement through the site, exceeded levels predicted in the FEIS by 71% (S 10.3, Table 27, pg 115) despite the closure of AWAR over 122.5 hours across 10 days and essentially no water tanker traffic that month (Appen. 33, 2021 AWAR Traffic Data).

#### **Recommendation**

Agnico Eagle should clarify whether and when traffic volumes predicted in the FEIS will be attained, and if they won't be attained, what implications this has for assessment of impacts of the project on wildlife.

#### **Agnico Eagle Answer**

Agnico Eagle prepared a response on traffic volume on the AWAR relative to predictions for the Government of Nunavut (GN) (GN-TRC-07) as part of the Waterline FEIS Addendum in November 2020. The response acknowledges that traffic monitoring results have been reported in a number of different ways making comparison to the FEIS (Agnico Eagle 2014) and 2018 FEIS Addendum (Agnico Eagle 2018) challenging. GN-TRC-07 shows that the results from 2019 traffic monitoring were 35 round trips per day during July where as 44 and 49 round trips per day in July were predicted in the FEIS and 2018 FEIS Addendum, respectively, Traffic during the operations phase on the AWAR during July has been less than predicted in either the FEIS or the 2018 FEIS Addendum.

Agnico Eagle will look into modifying Table 27 of the Annual Report (AWAR Monthly Traffic Summary) to facilitate the review of this Table for future Annual Reports.

### **KivIA-2 Arctic fox mortalities**

#### **Comment**

The majority of mortalities in 2021 were related to trapping of Arctic fox - including 3 from vehicle strikes and ~25 trapped and euthanized after an apparent rabid fox attack (S 9.5, Table 19, pgs 45-46). Sixteen of the foxes were trapped and killed at the mine kitchen or landfill. It is unclear whether waste management practices were responsible for the high numbers of Arctic foxes present and subsequently euthanized at the mine site.

#### **Recommendation**

Agnico Eagle should clarify why so many Arctic foxes were at the mine site and why they required euthanizing. The TEMMP should also clarify whether rabies was confirmed among foxes at site.



### Agnico Eagle Answer

During the winter months, cover habitat and food are scarce resources in the tundra for the Arctic fox. The infrastructures at the Mine site provide wind shelter, which can contribute to attracting Arctic foxes.

Agnico Eagle limits interactions between foxes and workers through various measures amongst which toolbox meetings and education and by implementing proper waste management practices.

Agnico Eagle informs the GN of Arctic fox presence on site and as explained in section 9.5 of the 2021 Annual TEMMP report follows the GN's guidance relative to trapping and euthanizing problematic Arctic foxes.

The GN informed Agnico Eagle of the presence of rabies in the fox population to ensure precautions were taken to protect the workers. Agnico Eagle does not conduct tests to confirm the presence of rabies among foxes at site.

### **KivIA-3 Collared Caribou Data Share Agreement**

#### Comment

The 2020 Meliadine annual report noted "A request for access to caribou collar data for this report was submitted to the GN DoE on October 27, 2020. Collar data were not provided to Agnico Eagle at the time this report was completed." (2020 annual report, S 12.0, pg 35)". In the 2021 annual report, Agnico Eagle again stated "A data sharing agreement for caribou collar data with the GN DoE is currently being developed" (S 12.3, pg 52). Fine-scale collar movements would inform caribou movement patterns in relation to AWAR and vehicle traffic, such as "Past analysis of collar data interactions with the Mine infrastructure and AWAR indicate no strong local scale deflection effects ... (Appendix E in Golder 2021)". The technical memo Revised Collar Caribou Meliadine AWAR Interactions (NIRB PC NO.006 T&C 44), Golder, 22 April 2022 was completed without the benefit of access to collar data. It is incredulous that Agnico Eagle and the Government of Nunavut Department of Environment have been unable to develop a data share agreement after more than a year of efforts.

#### Recommendation

Agnico Eagle and the Government of Nunavut Department of Environment should develop a long-term (for example, life of the mine) data share agreement to enable Agnico Eagle to conduct analysis of collar movements at broad and fine (individual collar trajectories) scales to aid in interpretation of monitoring and mitigation effectiveness at the Meliadine mine.

### Agnico Eagle Answer

Agnico Eagle understands the KivIA's concerns and wishes to reassure the KivIA that discussion to this effect with the GN are ongoing. This topic has been brought to the Terrestrial Advisory Group (TAG)'s attention and will be further discussed within the TAG in upcoming meetings.



## **KivIA-4 Collared caribou AWAR report**

### Comment

This section (S 12.3 Collared Caribou Inventory) states "Past analysis of collar data interactions with the Mine infrastructure and AWAR in indicate no strong local scale deflection effects although more regional effects have not been assessed" (Appendix E in Golder 2021), which refers to the January 2021 Golder report. The KivIA has commented to NIRB on the revised report released in April 2022 (Golder 2022), finding it equally lacking (KivIA technical memo, Comments on Revised Collar Caribou Meliadine AWAR Interactions, 27 May 2022).

The section also refers to caribou typically entering the Regional Study Area (RSA) in April and leaving sometime between April and October and also lingering from October to March, but the frequency and years when this happened is not explained relative to the 13 of 27 years of presence in the RSA based on the collar data. The report goes on to state "In consideration of these results, impacts to the Qamanirjuaq herd due to the Project have the potential for limited transboundary effects" (S 12.3, pg 52). However, it is not just numbers of years that collared caribou are in the proximity of the mine site but also the proportion of the Qamanirjuaq herd that is exposed to the Meliadine and how that relates to "limited transboundary" effects.

### Recommendation

1. Agnico Eagle should consider the comments received on its April 2022 revised collar caribou Meliadine AWAR interactions report, and through consultation with interested parties, conduct a more comprehensive analysis; and
2. Agnico Eagle should identify the proportion of collars within the Regional and Local Study areas for the years when the collared caribou are within those areas to justify the statement about the limited transboundary effects.

### Agnico Eagle Answer

1. Agnico Eagle would like to thank all parties for contributing with their comments on the revised collar caribou Meliadine AWAR interactions report. At the moment, the comments are under revision. The main findings and next actions will be discussed within the TAG.
2. Agnico Eagle will consider this approach and discuss it within the TAG

## **KivIA-5 Caribou Advisory**

### Comment

Caribou presence was monitored based on collar maps twice a week and ground surveys every 2 days (Level 2) then three times a day (Level 3) for the mine site and AWAR. Caribou numbers within 5 km were used to trigger mitigation according to the decision tree (TEMMP v 4, Fig. 3, pg 38). While Table 22 of the TEMMP report (S 12.4.2, pg 54) summarizes the timing and duration of the mine site and AWAR closures and comments with caribou observations, there are no summaries of the surveys and their observations or the collar maps that integrate into these closures. This lack of detail makes it difficult to assess how effective the monitoring and the triggers for road closures were. The surveys and their observations should be cross-referenced



to the behaviour and camera studies to relate the traffic frequency when the road was closed and when the caribou crossings were observed. Without integrating the monitoring, KivIA is uncertain as to how effective the decision trees and the consequent mitigation were.

#### Recommendation

1. Agnico Eagle should provide a more detailed accounting of the monitoring surveys and their caribou observations and relate them to the application of the decision tree and site work suspension or road closures.
2. Agnico Eagle should relate traffic frequency from the camera study to road closures and integrate these data with the information on crossings and site work suspension or road closures to estimate mitigation effectiveness.

#### Agnico Eagle Answer

1. Agnico Eagle follows the decision tree stated in the TEMMP, in Appendix 32-13 of the 2021 Annual Report. At site, Agnico Eagle conducts surveys at the highest point of the mine, allowing a 360-degree observation of any herd around the Mine site. The AWAR is monitored by the Environment Department and its third-party consultant (ERM) caribou biologist who reports the presence of any herd. Caribou location maps resulting from these surveys in vicinity of the Mine site are sent to KivIA and other interveners 3 times per day, every 6 hours.
2. Agnico Eagle thanks the KivIA for their recommendation to use the cameras installed during the migration to study traffic frequency during road closure and evaluate mitigation effectiveness. However, Agnico Eagle would like to note that the cameras are taking photos and not videos, which could imply limitations on the eventual interpretation.



## **KivIA-6 Impact predictions**

### Comment

A summary of the impact predictions proposed in the TEMMP was provided in Table 24 (pg 57; and also provided in Table 2, pg 8). Under the monitoring indicator "sensory disturbance", which relates to the threshold of "<10% caribou deflections from AWAR", caribou behaviour monitoring is identified as the appropriate monitoring method. In their response to our comments on the 2020 annual report (letter of 28 July 2021), Agnico Eagle acknowledged that "30-minute behaviour surveys are unlikely to provide meaningful results that quantify delays and deflections from the AWAR".

### Recommendation

Agnico Eagle should correctly identify in Tables 2 and 24 which monitoring method will be used to identify caribou deflections from AWAR.

### Agnico Eagle Answer

Agnico Eagle thanks the KivIA for this observation. The text will be modified to provide some clarification. The 30-minute behavior survey was designed to document how caribou groups respond to different kind of disturbances and give a timeline of the recovery period. While it is possible to use the results of the behaviour study to get some sense of the occurrence of deflections for caribou observed immediately next to the road, behaviour surveys are not designed to measure deflections. This is because behaviour surveys are limited to caribou within visual range (up to a maximum of about two kilometers), and deflections may occur on a larger spatial scale. Behaviour monitoring also does not allow tracking of groups of caribou over time. The spatial and temporal requirements of detecting deflections necessitate the use of satellite collar data. The text in Table 2 and 24 will be modified to reflect that satellite collar data is the primary method that can be used for monitoring deflections.

## **KIA-7 Caribou behaviour**

### Comment

The behavior study started 29 June 2021 within 2 days of large groups of caribou seen passing through the vicinity of the mine (a week earlier than 2020). The report does not mention that calves were initially only about 3 weeks old and thus their cows would be more responsive to disturbance than later in the summer. Peak lactation is about 3 weeks after birth so the cows would be also highly motivated to be foraging.

Caribou behavior was measured during 46 30-min bouts from 29 June to 12 July 2021 and 56 bouts during 1-17 July 2020. Results were combined for 2020 and 2021. Responses to disturbances (vehicles, mostly Project pickups and ATVs) were recorded during 55% (56/102) of the sample bouts. Caribou respond to a vehicle with more caribou alert or running; typically, most (50-80%) of the group responded and then resumed their previous behaviour within 6 minutes. Caribou responded less (i.e., less alert behaviour or running) when further than 1,000 m from the road. However, averaging over the 30 min sampling period limited the sensitivity of the analyses and groups sizes were larger further from the road. The type of vehicle did not change the



responses nor the number of disturbances. The bouts to record responses to convoys were too few to allow analysis.

The study is well-presented and analysed and mostly meets its objective which was to determine if caribou budgets change with distance from the mine and to document caribou response (specifically, distance to AWAR, large vs small groups, and with or without disturbance). In particular, the results on documenting caribou responses can be used to establish, with Terrestrial Advisory Group (TAG) input, qualitative thresholds for the amount of sensory disturbance. For example, as each disturbance could interrupt foraging/lying time by about 6 minute, and a cow spends about 70% her daily activity foraging and lying (ruminating), then a threshold can be estimated to reduce the risk of a cow not gaining enough weight to support her calf and herself.

However, sample size was limited partly because the presence of caribou on the road halted most vehicle traffic except quads. KivIA suggests that this could become part of the study - caribou responses to stationary vehicles to determine if it is an effective mitigation technique. Also, the analyses did not separate out bull (non-calf) groups from cow and calf groups, which needs to be tested given the young age of the calves. Although wind speed and temperature did not influence caribou responses, an integrated wind/temperature index to mosquito and warble flies should be tested.

#### Recommendation

Agnico Eagle should:

1. Continue monitoring behaviour responses but focus on responses to stopped vehicles and convoys;
2. Re-analyze the behaviour data to examine average behaviour within a 30-minute sampling period and separate cow-calf groups from non-calf groups; and
3. Working with TAG, determine how duration of behavioural responses can be used to determine thresholds for sensory responses (in addition to the proposed <10% deflection rates; Table 2, pg 8).

#### Agnico Eagle Answer

1. Agnico Eagle thanks KivIA for their comment and wishes to clarify that prior to the 2022 field season, Agnico Eagle added several fields for additional data collection to the behaviour survey form. Fields added included identifying whether a vehicle was stopped or moving during a disturbance event. Following the KivIA suggestion, focus was placed on observing caribou during convoys and for stopped vehicles. It is however important to note that behaviour surveys at Meliadine are conducted opportunistically, as caribou can only be observed from project infrastructure for a short period during the year, therefore behaviour survey results depend on where the caribou decide to use the project area.
2. Agnico Eagle thanks KivIA for their comment and wishes to clarify that the 2022 analysis are ongoing and will allow to confirm if the sample size allows for, examining behaviour *within* each survey period, as opposed to averaging over the entire survey period. In addition, data has been collected since 2021 on group composition (i.e. cows and calves, bulls, etc.) and will be included in the 2022 analysis.



3. Agnico Eagle thanks KivIA for their comment and will address it within the TAG.

## **KIA-8 Camera Study**

### Comment

The study used 27 cameras taking both timed and motion-triggered photos along the AWAR from mid-June to mid-July 2021. Four cameras within 5 m of the road were specifically to monitor traffic. The cameras recorded caribou over a relatively brief 10-day duration with peak counts of up to 2,000 caribou/day. Caribou were detected more consistently during the day (09:00 to 21:00 hr) than at night in 2021, which KivIA suggests is noteworthy in designing future mitigation. Caribou crossed AWAR at a higher frequency at AWAR Km 22-24, which is consistent with local knowledge, suggesting that the cameras are more useful than caribou collars in identifying where caribou cross the road. Road structure (slope, substrate, height, and surrounding habitat) did not influence caribou crossing the road but the road is relatively uniform along much of its length. Pick-up trucks and quads accounted for almost 2/3 of the traffic; water tanker truck traffic started in August after the cameras were removed (TEMMP Report, Table 23, pg 56). The lag time between a vehicle passage and a caribou crossing (caribou within 5 m of the road and assumed to have crossed) averaged 1 hour 18 minutes. The time was more variable for heavy vehicles than light vehicles and quads.

The 2020 and 2021 camera results met three objectives which were to evaluate a) if caribou use specific locations along the AWAR; b) how road construction (berm material, height and slope) affects caribou crossings; and c) the relationship between vehicles and timing and location of caribou observations. The 4<sup>th</sup> objective to estimate how the AWAR and site infrastructure contribute to cumulative effects was not addressed. The report was clear, useful and with excellent figures.

### Recommendation

1. Agnico Eagle should continue the camera study but provide greater details on vehicle passage rate (minutes between passages) and timing of last vehicles passage relative to caribou crossing, i.e., table format for the data including numbers and kind (cow-calf or non-calf) of caribou that crossed, and assessment of expected and observed crossing rate based on traffic frequency);
2. Agnico Eagle should provide data that tests the assumption that a caribou within 5 m of the road actually crossed the road;
3. While the camera study is designed to be complementary to the objective of the caribou collaring program (TEMMP Section 4.7), KivIA recommends that Agnico Eagle examine if and how the cameras could also be complimentary with the behaviour study; and
4. Agnico Eagle should discuss with TAG if and how cameras can be used to address cumulative effects.



### Agnico Eagle Answer

1. Agnico Eagle thanks the KivIA for their comment. With the addition of another year of data from 2022 (which just concluded) there will be two years of detailed traffic data. This will be used in the next report to detail vehicle passage rate and approximate caribou group size and composition (cow-calf, etc.). It should be noted that there are some limitations to estimating group size and composition using photos, as it is difficult to differentiate individual caribou between photos, especially when the group is on the move. As for the assessment of expected and observed crossing rate, Agnico Eagle would like to note it will be difficult or impossible to estimate expected crossing rate with the cameras alone because there is no control dataset. Assessing the expected crossing rate would require additional input from satellite collar data to determine the extent to which caribou are deflecting out of the range of the cameras. Agnico Eagle welcomes discussion on how best to accomplish this with the available data.
2. Agnico Eagle notes that the photos themselves typically have enough of the adjacent road in the view to directly capture caribou crossing the road. These can be considered "confirmed" road crossing events. For scenarios in which caribou were travelling at an angle to the road or where the crossing itself was obscured or out of sight, the crossing may be considered "probable". The caribou behaviour surveys and collar data allow to hypothesize that caribou that are hesitant to cross the road typically stay more than 100m from the road and would not be captured by cameras. The assumption is based on the fact that by the time they are within camera range, they are almost always on route to cross the road. However, as noted this is an assumption and future analysis will include a breakdown of whether road crossings were "confirmed" or "probable".
3. Agnico Eagle acknowledges there are numerous opportunities to combine datasets, as the camera data is designed to fill in data gaps on a temporal scale, and the behaviour data fills in data gaps on a spatial scale. Both are relatively fine scale modes of data collection, and collar data would be required to gain a full picture at a broader scale. The recommendation will be investigated for the 2022 data analysis.
4. Agnico Eagle agrees with the KivIA and will refer the comment to the TAG for further discussion.

### **KIA-9 Concordance with Terms of Reference**

#### Comment

KivIA has reviewed Agnico Eagle's progress with the Terms and Conditions of Project Certificate No.006 Amendment No. 002 (March 2022) and finds that further progress is needed:

- The failure to integrate monitoring with the GN's regional caribou collaring program has already been mentioned in the preceding comments.
- KivIA is uncertain without more details as to how the routine wildlife survey data (including caribou) contribute to an understanding of cumulative effects or assist in anticipating large caribou migrations (S 1.2.1, pgs 2-3) without more information on the range of natural (annual) variation.
- Term and Condition (T&C) 45 (Table 1, pg 2) requires that the "Proponent shall give special consideration for supporting regional studies of population health and harvest programs for Qamanirjuaq caribou" but KivIA is uncertain about the input and the extent



of the regional caribou health programs and seeks clarification about what is meant by health programs and how Agnico Eagle contributes.

- The threshold of not more than 1 Arctic fox project-related mortality was greatly exceeded in 2021. The adaptive management of "On-going waste management and, regular toolbox meetings reiterating that any disrespect of wildlife or of Me/iodine's wildlife policy is unacceptable and against company rules" (S 9.6, Table 20, pg 47) does not address T&C 55 to ensure monitoring and mitigation for the Project is responsive to undesirable rates of mortality.
- The requirement for a detailed presentation and analysis of the distribution relative to Project infrastructure and activities for caribou (T&C 56) should include more details of the road and site surveys and their integration with the behaviour and camera surveys. T&C 56 also requires information on annual environmental conditions including timing of green-up (which could be based on local observations or satellite imagery).
- While Agnico Eagle met the requirements for T&C 57 (detailed analysis of wildlife responses to operations with emphasis on wildlife behaviour, and mortalities), information on displacements and a demonstration and description of how the monitoring results contribute to cumulative effects of the project are needed.
- T&C 118 specifies weekly winter track surveying and summer and fall surveys undertaken on foot twice per month, but S 12.5 does not provide these data at the monthly scale and doesn't provide them in a format that examines trends throughout the year.

### Recommendation

Agnico Eagle should provide greater detail in how it is meeting the Terms and Conditions relative to caribou and other wildlife.

### Agnico Eagle Answer

Agnico Eagle thanks the KivIA for their comments. Below is some information related to the points listed above.

1. Agnico Eagle would like to refer KivIA to the answer provided to comment KivIA-3. Agnico Eagle understands KivIA's concerns and wishes to reassure the KivIA that discussion to this effect with the GN are ongoing.
2. Agnico Eagle would like to refer KivIA to the answer provided to comment KivIA-4.
3. Term and condition 45 is addressed through various programs and initiatives such as the TEMMP and the MMSO, or the hunter harvest calendar that supports the regional studies of population health and harvest programs for caribou.
4. Agnico Eagle would like to refer KivIA to the answer provided to comment KivIA-2.
5. As for the timing of green-up, Agnico Eagle would like to refer KivIA to the answer provided to comment GN-04.
6. Agnico Eagle thanks the KivIA for their comment and will discuss with the TAG how to best incorporate this information in future TEMMP annual reports
7. Agnico Eagle thanks the KivIA for their comments and will account for it in the 2022 Annual Report.



## **KIA-10 2021 TEMMP Annual Report objectives**

### Comment

KivIA's review of caribou monitoring finds that the 2021 TEMMP Annual Report only partly meets its primary objectives (S 1.5, pg 7), which suggests uncertainty about effects of the mine. KivIA identified lack of information about whether three objectives (summary of year-round monitoring strategy, evaluating the function and validity of implemented monitoring strategies, and summarizing adaptive management strategies) were fully implemented. The exposure of caribou to Meliadine is high but there are uncertainties. Most caribou were reported during a brief period in late June to mid-July but incidental caribou sightings include January, September and December (Appendix 29 2021 Wildlife Observations). The extent of monitoring outside the main caribou post calving migration is not described (TEMMP S 12). The absence of analysis of any collar data is a particular limitation as those data are not only required as part of mitigation thresholds but also are required to describe the timing and extent (proportion of the Qamanijuaq herd) exposed to the mine and AWAR.

### Recommendation

Agnico Eagle should integrate incidental sightings, road survey, behaviour and camera monitoring results with collared caribou data to clearly describe year-round monitoring for caribou and to evaluate the function and validity of the monitoring strategies.

### Agnico Eagle Answer

Agnico Eagle thanks the KivIA for their recommendation and will account for it in future years. Agnico Eagle would like to note that any incidental sighting of caribou is recorded. The absence of data could indicate the absence of caribou observation outside of the migration period.

## **KIA-11 Incorporation of Inuit Quajimajatuqangit**

### Comment

KivIA appreciates Agnico Eagle's effort to incorporate Inuit Quajimajatuqangit (IQ; Table 3, Appendix 1) but notes that uses of IQ relies on individual quotes. KivIA suggests that a wider approach to relying on IQ would include the principles of IQ as, for example, listed by NIRB (<https://nirb.ca/inuit-quajimajatuqangit>). KivIA suggests, for example, the definition of deflection as a threshold for sensory disturbance (S 2.0, Table 2, pg 8) may benefit from working with Inuit elders and applying IQ principles such as Aajiiqatigiinni, Ikajuqtiigiinni and Qanuqtuurniq (Decision making through discussion and consensus, Working together for a common cause, and Being innovation and resourceful). KivIA also notes that NIRB has questioned whether taking a different approach to describing deflection is needed (K. Kaluraq, NIRB Chairperson, NIRB Public Hearing File No.: 11MN034 Transcript, Vol. 4, June 17, 2021 at pp. 653-654, lines 16-26 and 1-13). Currently, deflection is the only the only threshold for sensory disturbance of caribou (Table 2), which is why KivIA is recommending a different approach to its definition.



### Recommendation

Agnico Eagle should work with TAG and Inuit elders to apply IQ principles and knowledge to define deflection of caribou from the AWAR and mine site.

### Agnico Eagle Answer

Agnico Eagle thanks the KivIA for their comment and will account for it during TAG discussions.

## **KivIA-12 Tundra restoration**

### Comment

KivIA thanks Agnico Eagles and the University of Saskatchewan for their collaboration in undertaking such a useful series of studies (2018-2021) and their recommendations for reclamation. The studies are designed to contribute to Term and Condition no. 41 (“...a progressive re-vegetation program for disturbed areas”).

The report described how exploration drilling since the 1990s and on-going exploration have left hundreds of drilling waste sites averaging ~200 m<sup>2</sup> in size and typically with shallow sumps that have been filled with drilling wastes (ground rock, mud and additives). The recovery of vegetation on exploration drilling waste showed natural recovery after 20-25 years and the rate of recovery depended on depth of the drilling waste and availability of nearby vegetation, both of which are the basis for recommendations. Other studies with both laboratory and field-testing demonstrated the use of turfs (blocks of intact tundra) for active in-situ remediation. Unfortunately, we could not find where this work leads into plans for reclamation of the mine site.

The research was to include working without and local community engagement in Rankin Inlet and Baker Lake but COVID delayed the outreach programs.

### Recommendation

- Agnico Eagle should ensure that future exploration drilling follow the report recommendations to support natural vegetation recovery at drilling sites.
- Agnico Eagle should involve the TAG in reviewing the studies and how their results can be applied to reclamation at Meliadine.

### Agnico Eagle Answer

Agnico Eagle thanks KivIA for their comments and will assess how to include the University of Saskatchewan’s findings into future exploration drilling activities. Agnico Eagle is available to discuss the findings of this study with stakeholders who wish to do so.



## **KivIA-13 Nutrient Enrichment in Meliadine Lake**

### Comment

As set out by the AEMP Design Report, 2016, the Low Action Levels for Nutrient Enrichment in Water quality are as follows: Concentrations of nutrients in the NF area above the normal range, Concentration exceeds a defined percentage of AEMP benchmark, and Divergence of Trends in comparison to reference areas. Total Phosphorus measured at the NF sites in 2021 average 0.00731 mg/L, which is a significant increase from baseline measurement and within error of the 0.0075 mg/L Action Level. Of 23 measurements taken from March to September, 2021, 14 exceeded the 0.0075 mg/L benchmark. Further, Figure 4-8, Appendix 18 suggests that total phosphorus concentrations at the Near and Mid Field sites do not follow the same trend as the Mel-03 Reference sites from 2016 on.

Chlorophyll-a concentrations at the NF sites have also increased relative to baseline in trends not present at the Reference sites. Increases in size of Threespine Stickleback relative to reference may also suggest an increase in primary productivity in the East Basin. These increases, though not yet exceeding the Action Levels, are indicative of increasing nutrient enrichment of the East Basin.

### Recommendation

Agnico Eagle should amend the statement in S 7.1.4 to acknowledge that phosphorus concentrations have increased over time in the East Basin of Meliadine Lake. Agnico Eagle should explore strategies to mitigate the impact of nutrient enrichment in the East Basin, including but not limited to increasing the volume of contact water diverted to Itivia Harbour.

### Agnico Eagle Answer

Total phosphorus concentrations have, in general, increased since the baseline period from the lower end of oligotrophic status (0.004 mg/L) to near the AEMP Action Level of 0.0075 mg/L. There is, however, some uncertainty about the natural range in phosphorus concentrations in Meliadine Lake given sparse and highly variable data collected during the baseline period (Figure C2-23). In 1997, the concentration reported in the East Basin (MEL-01) in July was at the upper limit of oligotrophic status (0.01 mg/L). Furthermore, phosphorus concentrations have periodically exceeded the upper limit of oligotrophic status at the reference areas. For example, phosphorus was measured at 0.03 mg/L in the samples taken in the Northwest Basin (MEL-04) in July 1997. Near the outlet of Meliadine Lake to the Meliadine River (MEL-05), 5 of the 7 samples collected in July from 1997 to 2011 had phosphorus concentrations that were equal to or greater than the AEMP Action Level. On a lake-wide basis, phosphorus concentrations have typically measured within the range of oligotrophic status (0.004 mg/L to 0.01 mg/L), but the use of 75% of the upper limit of oligotrophic status as the AEMP Action Level means we can likely expect periodic exceedances of the AEMP Action Level at MEL-01 in the future. It's important to emphasize that phosphorus loadings decreased significantly after the sewage treatment plant at the main camp came online in November 2017.

Based on the available data from water chemistry and phytoplankton monitoring programs, the concentration of total phosphorus in water samples is a relatively weak line of evidence for deciding if effluent is causing nutrient enrichment and effects to primary productivity.



Phytoplankton community endpoints such as total biomass and chlorophyll-a are a better indicator of whether effluent is causing nutrient enrichment and effects to primary productivity. As mentioned in Section 7 of the 2021 AEMP report (Phytoplankton), phosphorus and nitrogen concentrations in surface water do not appear to be strongly influencing phytoplankton biomass or chlorophyll-a based on data collected at the NF, MF, and reference areas in Meliadine Lake since 2013 (Figure 6.9). Most of the phosphorus in freshwater occurs as organic phosphates, cellular constituents of organisms, and within or adsorbed to inorganic and dead particulate organic matter (Wetzel 2001). Among the various chemical forms of phosphorus in freshwater systems, orthophosphate is the only form of soluble inorganic phosphorus directly utilized by aquatic biota<sup>1</sup>. Challenges with accurately estimating orthophosphate, combined with rapid turnover, means total phosphorus is typically recommended as the default parameter to include in monitoring programs. Nonetheless, orthophosphate concentrations at the near-field and mid-field exposure areas are typically below the limit of detection (see figure below). Orthophosphate was more routinely detected at MEL-01 and MEL-02 from 2015 to 2017 before sewage from the Exploration Camp was diverted to the sewage treatment plant at the main camp.

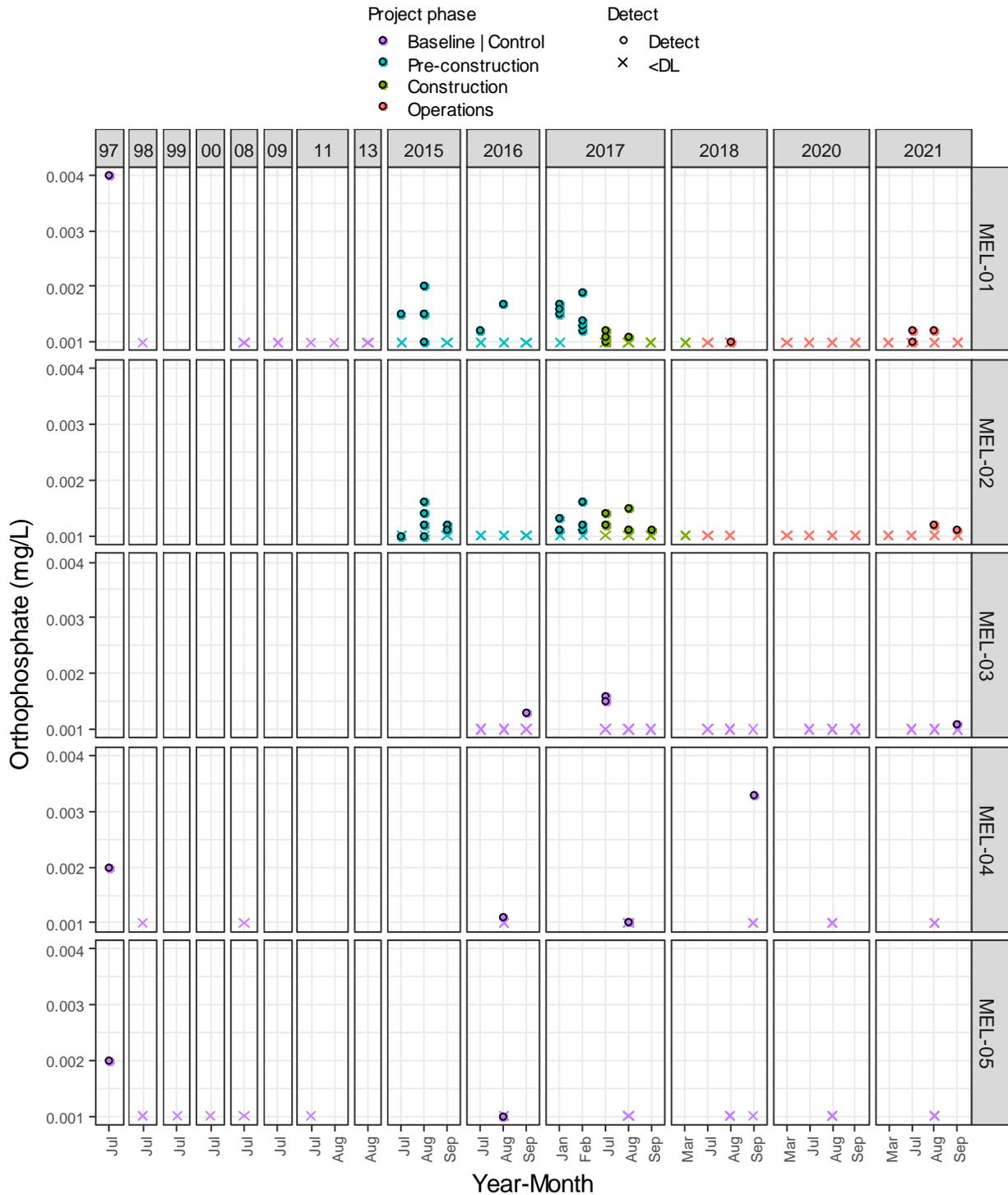
As ECCC points out, there is some evidence that the East Basin of Meliadine Lake is more productive than the reference areas, particularly when looking at the chlorophyll-a data in 2021. Threespine Stickleback in the exposure area are also heavier for a given size compared to fish from the reference areas. The Threespine Stickleback results are explored in greater detail in the Cycle 2 EEM Interpretive Report (in preparation), but preliminary results show that the differences in condition between the exposure and reference areas for male and female fish, for both parasitized and unparasitized populations, are less than the critical effect size of 10%. According to Environmental Effects Monitoring (EEM) guidance, effects less than critical effects sizes (CES) are unlikely to adversely affect the health of the fish population.

The effect of phosphorus and other nutrients on primary productivity will continue to be evaluated each year as part of the Phytoplankton Study.

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<sup>1</sup> Available at: <https://ccme.ca/en/res/phosphorus-en-canadian-water-quality-guidelines-for-the-protection-of-aquatic-life.pdf>

Figure 1. Orthophosphate concentrations (mg/L) in Meliadine Lake from 1997 to 2021.





## **KivIA-14 Tailings Storage Facility**

### Comment

This section states *"There is a plan in place to reduce dusting from the TSF. This includes a deposition plan to limit the time that placed tailings are exposed prior to being covered by fresh tailings. Watering of the tailings will be used for tailings that cannot be covered for some time."*

This section also states *"There is sediment along the toe of the TSF which could be fines from the waste rock cover on the TSF or from the uncovered tailings material. Transport of tailings could be from dusting or possible migration of fines from the dry stack into the perimeter rock fill of the TSF. It is recommended that some investigation be done to characterize the sediment and the method of transport"*

### Recommendation

Agnico Eagle should continue to monitor the effectiveness of the current mitigation methods for dusting, and should characterize the sediment and the method transport related to dusting from the TSF.

### Agnico Eagle Answer

Agnico Eagle will continue to monitor dust and the effectiveness of current mitigation methods and will investigate the sediment along the toe of the TSF. The result of this investigation will be reported in the 2022 Annual Report.

## **KivIA-15 Tailings Storage Facility**

### Comment

This section states *" It is recommended that the tailings be tested to determine their unfrozen content curve below 0°C to determine how much of the tailings remain frozen.11"*

### Recommendation

This work is expected to be potentially implemented in Q4, 2022. The KivIA strongly recommends that this testing be implemented in Q4, 2022.

### Agnico Eagle Answer

Agnico Eagle is working with the design engineer to develop an adequate testing program to determine the unfrozen content curve. The expected start date of this testing remains Q4, 2022 at the moment, as stated in Appendix 8 of the Annual Report, pending laboratory availability.



## **KivIA-16 Landfill Capacity**

### Comment

This section states *"The landfill is nearing its current capacity."*

### Recommendation

Can AEM confirm what capacity remains in the current Landfill, when a new landfill will be required and where it will be located?

### Agnico Eagle Answer

As of July 2022, there is approximately 3,200 m<sup>3</sup> of storage within the current landfill. In the short to medium term, the existing landfill berms will be raised to accommodate additional storage. The existing landfill will require a raise of the berms before the end of the year.

For the long term, an alternate landfill location is being assessed.



## **Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)**

### **CIRNAC-1 Resolution of Comments on the 2020 and Previous Annual Reports**

#### Comment

CIRNAC's review of the 2020 Annual Report generated 20 comments for AEM's consideration. Based on responses provided by AEM, 14 of these have been resolved while six remain unresolved. The following previous comments remain outstanding and are discussed below in sequence:

- CIRNAC #1.1 - Geochemical Monitoring, Acid Rock Drainage/Metal Leaching (ARD/ML) Testing (T&C 19)
- CIRNAC #1.8 - Site Water Management (T&C 27 and 28)
- CIRNAC #4 – Mill Use of Containment Pond 1 (CP-1) Water (T&C 28)
- CIRNAC #6.1 - Geotechnical Inspection Concerns/Issues – Permafrost Degradation (T&C 17 and 21)
- CIRNAC #10 – Consultation with Outfitters and Guides
- CIRNAC #11 - Hunter Harvest Survey

#### **CIRNAC-1.1 Geochemical Monitoring, Acid Rock Drainage/Metal Leaching (ARD/ML) Testing (T&C 19):**

#### Comment

In 2020, the number of waste rock samples classified as having Uncertain Acid Rock Drainage (ARD) [i.e., Neutralizing Potential Ratio (NPR) between 1 and 2] or potentially acid generating (PAG;  $\text{NPR} \leq 1$ ) increased compared to previous years. CIRNAC recommended that moving forward AEM:

- Track volumes of waste rock classified as having PAG ( $\text{NPR} \leq 1$ ) and Uncertain ARD potential ( $1 < \text{NPR} < 2$ ) from the underground mine and open pits.
- Provide information on where waste rock was used for construction, the amount of waste rock used for construction and confirm that the waste rock used was not PAG.

The 2021 Annual Report provides information on corrections that were made to the measurement of neutralizing potential (NP) that was confirmed by the laboratory to underestimate the amount of NP in the sample, leading to lower than actual NPR values and an artificially greater number of samples being classified as Uncertain or PAG. Using the updated methodology, only two waste rock samples from the underground mine were classified as Uncertain, and none were classified as PAG in 2021.

However, the information requested by CIRNAC as noted above was not found within the 2021 Annual Report or appendices.

CIRNAC notes that tracking the quantities and distribution of Uncertain and PAG waste rock will help ensure the proper management of these materials to avoid ARD/ML issues and equally identify any emerging trends of increasing quantities of problematic waste rock requiring management.



### Recommendation

CIRNAC recommends that moving forward AEM:

- Track volumes of waste rock classified as Uncertain and PAG from the underground mine and open pits; and
- Confirm that waste rock used for construction was not PAG.

### Agnico Eagle Answer

In 2021, as stated in the Annual Report, all waste rock samples sent for ARD analysis were classified as non-PAG, with the exception of two samples of underground waste rock that were classified as uncertain. These samples are considered a low risk given the excess neutralization in all other waste rock samples collected and represent a minor proportion (1%) of all waste rock samples collected in 2021 (165 samples for open pit and underground waste rock, excluding the duplicates). It also should be noted that a considerable quantity (387,891 tonnes) of underground waste rock was kept underground for backfilling purposes.

Moving forward, Agnico Eagle will track the volumes of waste rock classified as uncertain and PAG and report this information in the Annual Report, if applicable.

Since no waste rock sample was classified as PAG in 2021, Agnico Eagle confirms the waste rock used for construction purposes in 2021 was not PAG.

### **CIRNAC-1.2 Site Water Management (T&C 27 and 28):**

#### Comment

The 2020 Annual Report, AEM provided the SNC Lavalin's (SNC 12 Nov. 2020) upper bound model predictions of surface water total dissolved solids (TDS) loads to CP-1, in which "rest of site" was predicted as the most significant contributor to 2020 TDS loads ( i.e., 1,408 t of the 1,785 t) and much less so for 2021 loads (i.e., 373 t of the 857 t). During review of the 2020 Annual Report, CIRNAC requested that AEM provide information on the nature and make-up of "rest of site" areas/facilities that contributed significantly to the TDS loads to CP-1.

In their response, AEM provided information generally describing the make-up and nature of the site but not the specific information requested for.

Appendix 32-9 Ore Storage Management of the 2021 Annual Report provides information on the capacity of the ore storage area being approximately 1,260,000 t (~672,800 m<sup>3</sup>). Table 4-3 provides information on the Evolution of Ore Stockpiles at OP2 (Stage 1/Stage 2).

From review of this information, it is unclear to CIRNAC:

- Whether the table values for years 2019, 2020, 2021 are actual or plan values?
- What these values represent; are they quantities of material stored at a specific time, or total quantities stored during the year at these locations?



- To what degree high-grade ores go directly to the mill. Some parts of the document state that all high-grade ores go directly to the mill while other parts of the document state that only a portion of these ores go directly to the mill?

It would be helpful to have a more definitive understanding of ore characteristics and quantities that were stored (compared to plan) during the period when higher TDS loads were noted in CP1, to limit similar events in the future.

#### Recommendation

- Clarify whether the values presented in Table 4-3 of Appendix 32-9 (Ore Storage Management) for years 2019, 2020 and 2021 are actual or plan values and indicate exactly what these values represent;
- Clarify whether all or only a portion of high-grade ore goes directly to the mill;
- Provide a description of ore storage operations and how much fresh ore (from underground and open pits) are placed on the ore pad in each year along with a description of ore retention times on the pad; and
- Update the SNC Lavalin load analysis and report on the actual vs. predicted trends of TDS loads to CP-1, especially the contribution from the “rest of site”.

#### Agnico Eagle Answer

- Table 4-3 represents the actual quantities ore quantities at year end. 2019 to 2021 numbers are the recorded state of ore pile on the 31<sup>st</sup> of December of each of the previous stated years.
- High Grade (HG) material is always prioritized; the aim is to send 25% as direct dump and 75% rehandled. Stockpiling High grade occurs only when there is more high grade material mined than the capacity to mill in a given month.
- Fresh ore placement on ore pad varies from year to year. A summary of the ore placement strategy is provided below.
  - High grade: For the first 4-5 years (2019 to 2024) fresh HG material retention time is in between 5 to 40 days. For the years 2025 and 2026, Open pit mining will occur mainly in high grade ore, hence mining of HG will be higher than milling capacity, and retention could be over one year until most of the ore is milled in end of the year 2026.
  - Low grade: This material will only be milled to ensure mill capacity is met. This material has been stockpiled since the beginning of mine life. The low grade material may be stockpiled for a duration of 4 to 5 years, before being steadily depleted in 2023 and onward (at a rate of approximately 100k Tonnes/year).
  - Marginal: This material will be milled at the end of mine life. The total stockpiled quantities will be around 85k Tonnes, stockpiled at an average rate of 12k Tonnes per year.
- At this time, Agnico Eagle does not plan on updating SNC Lavalin’s model (2020) that was provided as part of the NWB Water Licence Amendment process, as the more recent



GoldSim Water Balance and Water Quality Model (WBWQM) will be used and updated annually as per the Water Licence 2AM-MEL1631, Schedule B, Item 5 requirement.

The updated WBWQM results were reported in the 2021 Annual Report, Section 3.2. The primary modelling objective is the prediction of water and solute load transfers within the mine site facilities, and to the receiving environment for the period of 2019 to 2027. The GoldSim WBWQM is configured to predict the transfer of water and solute mass (loadings) from mined and non-contact areas into the relevant water management facilities. Concentrations of water quality parameters required by Type A Water Licence 2AM-MEL1631 Part F, Item 3 for all mine water management ponds and sumps are modelled, including CP1. Actual and predicted TDS trends to CP1 are presented in Figure 12 of the Annual Report. Water quality inputs to the water quality model, or source terms, are based on either a set of assumptions that reflect empirical observations from the operating mine site, data collected at analogue mine sites, or the results of various geochemical and metallurgical tests that have been undertaken to provide a basis for assigning likely future water quality associated with specific mine components

Agnico Eagle would like to clarify the term “rest of site” which was used in SNC Lavalin’s model is not a component of the GoldSim WBWQM. Previously, Agnico Eagle defined the “rest of site” as a grouping of the areas and facilities on site where runoff reports directly to CP1 and not the other containment ponds’ catchment areas. This included natural ground with vegetation and disturbed ground within the CP1 watershed, a portion of Waste Rock Storage Facility 1 (WRSF1), a portion of the Tailings Storage Facility (TSF), the Landfill area, and the Ore Stockpile (OP2), in addition to treated effluent produced by the Sewage Treatment Plant (STP), Landfarm Oil-Water treatment, and Reverse Osmosis Plant (RO). In the GoldSim WBWQM, these areas and facilities (with the exception of the Landfill and Landfarm Oil-Water treatment) are represented by individual source terms, as described previously, which contribute specific water quality concentrations and corresponding solute loading to CP1 in the applied runoff.

### **CIRNAC-1.3 Mill Use of Containment Pond 1 (CP-1) Water (T&C 28):**

#### Comment

During the 2020 Annual Report review, CIRNAC requested that AEM:

- a. Provide details related to when and how much CP-1 water was used in the mill in 2020.
- b. Clarify AEM's current position on the mill's use of CP-1 water to maintain CP-1 water level at the low end of operating water levels, under normal operating conditions.
- c. Provide information on potential use of CP-1 water by the mill for adaptive management drawdown of the CP-1 water level.



In their response, AEM indicated that “Agnico Eagle will maximize to the greatest practical extent, the use of Reclaim Water from Contact Water management facilities for use in the mill”. Agnico Eagle will apply this Licence condition to both normal operating conditions and adaptive management.”

CIRNAC did not see any discussion in the 2021 Annual Report with respect to AEM’s commitment noted above. On the contrary, Section 4.2 states *“The lower concentrations for metals in 2021 may be explained by the fact the mill feed water came from Meliadine Lakewhich, in general, has lower metals than CP1 surface contact water, which was used for the mill feed water in 2020.”*

No specific information was provided on use of reclaim water from CP-1 as mill makeup water. Based on AEM’s above statement it can be inferred that CP-1 reclaim water use in 2021 was zero.

CIRNAC note that maximizing the use of reclaim water in the mill will reduce discharges from CP1 to the environment (i.e., Meliadine Lake and marine discharges).

#### Recommendation

CIRNAC recommends that AEM include a section in future annual reports that explicitly discusses uses of CP-1 water in the mill and how AEM is complying with the licence condition to *“maximize to the greatest practical extent, the use of Reclaim Water from Contact Water management facilities for use in the mill.”*

#### Agnico Eagle Answer

In future Annual Reports, Agnico Eagle will include a section discussing the use of reclaim from Contact Water management facilities for use in the mill, drilling, and for dust suppression.

### **CIRNAC-1.4 Geotechnical Inspection Concerns/Issues – Permafrost Degradation (T&C 17 and 21):**

#### Comment

In both 2019 and 2020, AEM provided comprehensive geotechnical inspections carried out by Tetra Tech for all project facilities. Observations and recommendations were provided to AEM for consideration and AEM provided responses to Tetra Tech’s recommendations. While information was provided on freeze back of tailings, waste rock dams and dikes, no information was provided on permafrost degradation of other aspects of the operation.

For clarity, what CIRNAC is requesting is more general information on permafrost degradation that might be occurring across the site, in particular, within landforms / areas in between critical infrastructure areas, and areas affected by water channels. CIRNAC notes that permafrost is a valued environmental component and understanding the effects of operation on permafrost degradation is important to minimize any potential impacts.



### Recommendation

As per T&C 17 and T&C 21 of the NIRB Project Certificate for this project, CIRNAC recommends that AEM provides a discussion on the status of permafrost degradation that may be occurring as a result of AEM's construction and operation activities.

### Agnico Eagle Answer

In general, permafrost aggrades into the fills placed on the natural ground and AEM has not observed permafrost degradation across the industrial pad. Some localized permafrost degradation has been observed within/adjacent to some of the water management structures. These areas correspond to areas where ice rich materials are present within the natural ground and where the natural vegetation has been removed and/or where water is allowed to accumulate. AEM monitors these areas and repairs them when required. Additionally, the lessons learned from the performance of older infrastructure is being implemented into new infrastructure to minimize future permafrost degradation.

## **CIRNAC-1.5 Consultation with Outfitters and Guides**

### Comment

As part of its review of AEM's 2020 Annual Report, CIRNAC observed that no reference was made to consultation efforts with outfitting and guiding companies pursuant to T&C 104 of the Amended Project Certificate. Consequently, CIRNAC recommended that AEM:

- Provide an update on the outcomes of any consultation efforts undertaken with outfitting and guiding companies that operate in the Local Study Area and Regional Study Area regarding use of the area, specifically as it relates to hunting, fishing and guiding within proximity of the All Weather Access Road (AWAR).
- Report any updates to management plans based on consultation efforts.

In its July 28, 2021 response to comments submitted by interested parties, AEM thanked CIRNAC for this recommendation and committed to accounting for these consultation efforts in its 2021 Annual Report. CIRNAC is unable to confirm whether AEM consulted with outfitter and guiding companies or made any updates to management plans based on such efforts in 2021 pursuant to Project Certificate requirements. The submitted Project Certificate Concordance Table (Appendix 41 to the 2021 Annual Report) makes reference to section 7.9.1 of the 2021 Annual Report and the 2021 Terrestrial Environment Management and Monitoring Plan Report (Appendix 26 to the 2021 Annual Report) to this T&C but neither source provides information related to consultation efforts. These references may have been provided in error. In fact, there is no section 7.9.1 in the 2021 Annual Report. The closest section is 7.9 which relates to vegetation.

### Recommendation

The recommendation provided in CIRNAC's review of the 2020 Annual Report remains outstanding. CIRNAC recommends that AEM:



- Provide an update on the outcomes of any consultation efforts undertaken with outfitting and guiding companies that operate in the Local Study Area and Regional Study Area regarding use of the area, specifically as it relates to hunting, fishing and guiding within proximity of the AWAR.
- Report any updates to management plans based on consultation efforts. Future Annual Report submissions should endeavour to satisfy the information requirements of T&C 104 of the Amended Project Certificate.

#### Agnico Eagle Answer

In 2021, Agnico Eagle has contracted a third-party consultant, Nunavut Environmental Consultant to work alongside the KHTO in conducting the HHS and increase participation of local hunters, however consultation and participation of outfitting and guiding companies remained limited due to a combination of various factors.

In 2022, Agnico Eagle will work to increase consultation efforts with outfitting and guidance companies and will report for the results of those efforts in the 2022 Annual Report.

#### **CIRNAC-1.6 Hunter Harvest Survey:**

##### Comment

Pursuant to T&C 105 of the Amended Project Certificate, “The Proponent is strongly encouraged to consider incorporating information obtained from local outfitting and guiding businesses into its Hunter Harvest Survey where possible, and to include these organizations as potential respondents to surveys undertaken.”

Consistent with CIRNAC’s review of the 2020 Annual Report and supporting documentation, it is observed that AEM’s 2021 Annual Report, Terrestrial Environment Management and Monitoring Plan, and 2021 Terrestrial Environment Management and Monitoring Plan Report do not reference any communications with local outfitting and guiding businesses in the development and administration of a Hunter Harvest Survey.

In its July 28, 2021 response to comments submitted by interested parties on the 2020 Annual Report, AEM did not respond to a similar comment that was made by CIRNAC.

In its July 28, 2021 response to comments submitted by interested parties on the 2020 Annual Report, AEM did not respond to a similar comment that was made by CIRNAC.

##### Recommendation

The recommendation provided in CIRNAC’s review of the 2020 Annual Report remains outstanding.



CIRNAC requests that future Annual Report submissions include summaries of any interactions with local outfitting and guiding companies regarding the administration of its Hunter Harvest Survey, should they occur.

#### Agnico Eagle Answer

Agnico Eagle thanks CIRNAC for their comment and recommendation and will account for it in the 2022 Annual Report.

### **CIRNAC-2 Reducing Discharges to Meliadine Lake**

#### Comment

Surface contact water at the Meliadine site is diverted and collected within various containment ponds (CP1, CP3, CP4, CP5 and CP6) and ultimately stored in CP1. From there, the contact water is treated at the Effluent Water Treatment Plant (EWTP) for total suspended solids (TSS) and subsequently discharged via a diffuser to Meliadine Lake provided that effluent quality meets discharge limits, including for total dissolved solids. In 2021, 851,126 m<sup>3</sup> of treated water was discharged from CP1 to Meliadine Lake.

As part of the Nunavut Water Board 2020 Water Licence Amendment process, as well as the NIRB Saline Water Line review process, the Kivalliq Inuit Association had requested that AEM commit to eliminating effluent discharge to Meliadine Lake. AEM responded that it could not make that commitment but would commit to minimizing discharge to Meliadine Lake. Review of the 2021 Annual Report and its appendices did not find any reference to this commitment.

AEM has applied for and received approval to construct and operate a saline water pipeline system that can discharge up to 20,000 m<sup>3</sup> per day (consisting of up to 12,000 m<sup>3</sup>/day saline water and 8,000 m<sup>3</sup>/d surface contact water) to Melvin Bay during the open water season. Once completed, this system will allow AEM to minimize discharge to Meliadine Lake.

Minimizing discharges to Meliadine Lake has been expressed as a critical objective by the Kivalliq Inuit Association and local communities. It is incumbent that AEM make effort to reduce discharging into Meliadine Lake.

#### Recommendation

CIRNAC recommends that AEM:

- Update its management and operational plans to reflect the commitment to minimize discharges to Meliadine Lake.
- Describe what steps were taken in 2021 to minimize discharges to Meliadine Lake.

#### Agnico Eagle Answer

Agnico Eagle issued an Adaptive Management Plan in accordance with NIRB Project Certificate No.006 (Amendment No.002) Term and Condition 25. In the Adaptive Management Plan, the commitment to minimize discharge to Meliadine Lake via discharge to Melvin Bay through the



waterline is emphasized. The Adaptive Management Plan will take effect upon operation of the waterline.

Part E, Item 4 of the Water Licence requires Agnico Eagle to maximize to the greatest practical extent, the use of reclaim water from Contact Water management facilities for use in the mill, drilling, and for dust suppression. In 2021, Agnico Eagle utilized CP1 water for the purposes of dust suppression along hauling roads and in the open pit, and for drilling purposes in the open pit.

### **CIRNAC-3 Clarification of Modelling Assumptions**

#### Comment

In reviewing the 2021 Annual Report, CIRNAC notes the following:

- Figure 12 of the Annual Report shows measured and predicted TDS concentrations in CP1 for life of mine and closure. The Water Balance and Water Quality Model predicts the mean TDS concentration in subsequent years to be very close to the updated discharge limit of 3,500 mg/L, with a very small margin.
- Section 3.2.4 of the Annual Report describes the results of the Saline Water Quality Model as follows: “*The model forecasted the TDS, Ammonia and Radium-226 concentrations well in TIRI02 (Tiriganiaq Open Pit #2), however; an increased observed concentration was noticed in the winter season of 2021 for all constituents compared to the model forecasted concentration (Figure 15 to Figure 17). This increased concentration may be attributed to cryo-concentration. It should be noted this trend is not confirmed for Radium-226, due to having only one data point.*” Section 3.2.1 of the Annual Report notes that cryo-concentration is already considered in the model with the implementation of a temperature-based ice algorithm. In the annual report, AEM does not provide any recommended actions to improve the accuracy of these saline water quality predictions in TIRI02, particularly with respect to ammonia (and possibly radium-226).
- Section 4.2.4 of the Annual Report on the metal leaching of filtered tailings notes that one water quality result of total arsenic concentration in CP3 water was slightly above the Metal and Diamond Mining Effluent Regulations (MDMER) maximum authorized monthly mean concentration of 0.10mg/L. While this might be acceptable during operations it will not be adequate for closure when passive drainage will need to meet a lower criterion. Long-term predictions of arsenic by the Water Balance and Water Quality Model in CP1 over time to 2028 are predicted to max out at about 0.07 to 0.08 mg/L each year (Figure 11, Appendix 5 WBWQM Results).
- Figure 8 of the Annual Report indicates that seepage from tailings and waste rock stored on surface has elevated TDS concentrations (ranging mainly between 10,000 to 25,000 mg/L for tailings). The high salinity (high ionic strength) has the potential to affect metal leaching rates and mobility from the tailings/waste rock in response to ion exchange and/or complex formation. In reviewing the 2021 Annual Report and supporting documentation, it is not clear whether the high salinity of waste materials (tailings and waste rock) was considered by AEM in their geochemical modelling and Acid Rock Drainage/Metal Leaching (ARD/ML) predictions.



It is important to address the above items to facilitate planning and future actions to manage potential impacts on the environment.

### Recommendation

CIRNAC requests clarification on the following items pertaining to predictions of the Water Balance and Water Quality Model:

- a) Based on predicted levels of TDS in CP1, if the TDS discharge limit of 3,500 mg/L is exceeded again, how will water stored in CP1 be managed? Will it continue to be stored in CP1 until the waterline is commissioned?
- b) As cryo-concentration is already considered in the model, could the underestimated ammonia concentrations be the result of blasting?
- c) How will AEM reduce the arsenic values at closure to meet stricter post closure passive discharge requirements?
- d) AEM should provide a discussion (e.g., effects of suppressing the freezing point; implications for ARD/ML) on whether the presence of elevated TDS in waste rock and tailings has the potential to affect the long-term performance of the WRSF and TSF.

### Agnico Eagle Answer

a) Predicted TDS levels in CP1 indicate heightened concentrations approaching the end of the discharge season and peaking each year during the winter season, in which CP1 is frozen. The increase in TDS values is attributed to two causes.

First, during the discharge season, it is anticipated that TDS concentration will generally be inversely proportional to the volume of water in CP1. As discharge progresses and water levels are lowered, a rise in TDS may be attributed to a greater impact of elevated TDS loading from upstream. Section 3.1.7 of the 2021 Annual Report provides a general discussion on the TDS loading sources, however further investigation is still required to draw conclusions regarding the observed pattern of seasonally increasing TDS.

Second, as CP1 freezes, solute exclusion during ice formation is hypothesized to increase TDS concentrations below the ice. This process is discussed in more detail in section 3.1.7.1 of the 2021 Annual Report. However, this process generally occurs after seasonal discharge of CP1 has been completed, and therefore in the event the TDS were to rise above the maximum authorized monthly mean concentration (MAMMC) of 3500 mg/L, it would be maintained as a low volume of water in CP1 until the following freshet period at which point the TDS concentration would fall significantly.

Ultimately, forecasted TDS concentrations in CP1 over LOM are expected to remain below the MAMMC concentration of 3500 mg/L during the discharge period each year.

b) Agnico Eagle would like to clarify that section 3.2.4 states the temperature-based ice algorithm was implemented to model cryo-concentration in CP1 only. This component of the model was not included for saline water storage of Tiriganiaq Open Pit 2 (Tiri 02). Thus, the increase in observed concentrations compared to model predictions is still attributed to cryo-concentration during ice



formation in Tiri 02. AEM will assess the potential to include cryo-concentration water quality modeling for Tiri 02 in the future to validate this assumption.

c) Per the Interim Closure and Reclamation Plan (ICRP) submitted with the Water Licence Amendment, the closure plan for the TSF is to progressively place an engineered cover over the tailings as the tailings deposit reaches the ultimate elevation. Freeze-back of the tailings and cover placement are management actions being taken to ensure water from tailings does not impact the receiving environment.

Additionally, the contact water management system for the TSF will remain in place until mine closure activities are completed and monitoring results demonstrate that water quality conditions from the TSF are acceptable for the discharge of all contact water to the environment with no further treatment required.

An adaptive closure strategy has been adopted for the Meliadine Mine. The preliminary cover design adopted for the TSF at this stage will be further evaluated and updated based on the TSF performance monitoring, water quality monitoring and evaluation, and the overall mine closure plan. The final closure cover design for the TSF will be developed before mine closure.

d) Agnico Eagle thanks CIRNAC for their comment and will account for it in the 2021 Annual Report.

#### **CIRNAC-4 Cumulative Quantities of Ore and Waste Rock and Comparisons to FEIS Predictions**

##### Comment

Table 12 of the 2021 Annual Report provides a monthly listing of excavated ore and waste rock by source along with respective quantities (tonnages). However, the annual report does not provide year-over-year or cumulative information on quantities and comparison to Final Environmental Impact Statement (FEIS) predictions as would be expected. Furthermore, the annual report lacks information on the deposition quantities and distribution of waste rock. For instance, there is no information on how much waste rock was utilized in construction works.

In the Mine Waste Management Plan (Appendix 32-7), neither “Table 4.1 Schedule, Quantities, and Distribution of Waste Rock by Year” nor “Table 4.2 Schedule, Quantities, and Distribution of Overburden by Year” clearly state that the quantities provided therein are actual values for years 2019 to 2021 inclusive. By contrast “Table 5.1 Schedule, Quantities, and Distribution of Tailings by Year (V15\_Mille)” clearly notes that the quantities shown for years 2019 to 2021 inclusive are as built quantities.

CIRNAC notes that an understanding of cumulative values of waste materials stored on site is important for the assessment of the overall potential impacts of these materials to the environment and the mitigative measurements that may be required to manage them.



Recommendation

CIRNAC recommends that AEM:

- Provide the year-over-year or cumulative quantities of ore and waste rock with comparisons to FEIS predicted quantities .
- Provide information on the deposition and distribution quantities of waste rock (e.g. how much waste rock was used in construction works and locations, etc.).
- Clearly indicate waste rock quantities that are actual as opposed to planned and use the same approach for waste rock as used for tailings (i.e., use asterisk and notes to identify actual values in these tables).

Agnico Eagle Answer

- Agnico Eagle thanks CIRNAC for their comment and will include this information in future Annual Reports. Below is a table presenting a summary of total actual waste rock and ore tonnage for the years 2019-2021 compared to the FEIS predicted quantities.

Year	Actual Waste Rock tonnage	FEIS Waste Rock predicted tonnage <sup>1</sup>	Actual Ore Tonnage	FEIS Ore predicted tonnage <sup>1</sup>
2019	718,955	13,416,000	1,108,666	661,000
2020	4,003,532	38,017,000	1,402,899	2,370,000
2021	5,081,872	37,800,000	1,960,544	3,501,000

<sup>1</sup> From FEIS SD 2-8 Mine Waste Management Plan – Meliadine Gold Project, Nunavut, Table 1 (Agnico Eagle 2014)

- Table 4.1 of the Mine Waste Management Plan presents the waste rock deposition information, including the quantities used for construction. Section 4.3 of the 2021 Annual Report references the Table 4.1 of the Mine Waste Management Plan for as-built and expected waste rock usage per major location.
- Agnico Eagle thanks CIRNAC for the comment and confirms the quantities in Tables 4.1 and 4.2 are actual (as-built) values for the years 2019 to 2021. This will be clearly identified in future updates of the Mine Waste Management Plan.

**CIRNAC-5 Analysis of the Temporary Mine Closure**

Comment

Pursuant to T&C 90 of the amended Project Certificate, AEM was required to provide an analysis of the risk of temporary mine closure prior to the commencement of operations. AEM prepared a document entitled, “*Meliadine Project – Analysis of the Risk of Temporary Mine Closure*” dated February 1, 2019, and submitted a copy to the NIRB to satisfy the requirements of the Amended Project Certificate.



CIRNAC recognizes that AEM is compliant with this T&C, but would like to see the future Annual Report submissions be improved by providing more details as to the location of the document and a brief statement on whether updates are deemed necessary. The Project Certificate Concordance Table included as Appendix 41 to the 2021 Annual Report only states “See: *Analysis of the Risk of Temporary Mine Closure.*”

#### Recommendation

CIRNAC recommends that AEM provide a full citation to its Analysis of the Risk of Temporary Mine Closure, the relevant NIRB Public Registry Identification Number, and a brief statement on whether updates are deemed necessary in future Annual Report submissions.

#### Agnico Eagle Answer

Agnico Eagle thanks CIRNAC for their recommendation and will account for it in future Annual Report submissions.

### **CIRNAC-6 Employee Origin**

#### Comment

Pursuant to T&C 101 of the Amended Project Certificate, AEM is required to provide project-specific information regarding employee origin in its annual Socio-Economic Monitoring Report submissions. As stated in the T&C’s objective, such data will support “*the comparison in predictions of labour availability and employment opportunities with actual levels of employment from various demographic segments over different geographic areas.*”

The Term and Condition states, “*The Proponent shall include with its annual reporting to the NIRB a summary of employee origin information as follows:*”

- *The number of Inuit and non-Inuit employees hired from each of the Kivalliq communities, specifying the number from each;*
- *The number of Inuit and non-Inuit employees hired from each of the Kitikmeot and Qikiqtani regions, specifying the number from each;*
- *The number of Inuit and non-Inuit employees hired from a southern location or other province/territory outside of Nunavut, specifying the locations and the number from each; and*
- *The number of non-Canadian foreign employees hired, specifying the locations and number from each foreign point of hire.*

Unlike the 2020 Annual Report which contains the required information in the form of an appendix to the 2020 Socio-Economic Monitoring Report, AEM’s 2021 Annual Report does not provide some of the information requirements for this T&C. The Project Certificate Concordance Table included as Appendix 41 to the 2021 Annual Report makes reference to section 12 of the 2021 Annual Report and related appendices for further information on this topic. Section 12 of the 2021 Annual Report and the 2021 Socio-Economic Monitoring Report do not completely address the



T&C’s information requirements. The only information of value provided is the number of AEM Inuit employees hired by home community in the Kivalliq region. The Annual Report also includes the number of Inuit hired from the ‘Kitikmeot’, ‘Qikiqtani’ and ‘Outside of Kivalliq’ (p. 128). It is not clear if the ‘Outside of Kivalliq’ category includes the Kitikmeot and Qikiqtani regions or represents Inuit from other Canadian provinces, territories and countries.

Recommendation

CIRNAC recommends:

- AEM provide the employee origin information required under T&C 101 of the amended Project Certificate 006 and ensure this information is provided in future Annual Report submissions.
- AEM clarify how the “Outside of Kivalliq” category included in ‘Table 29: Home communities of AEM Inuit employees (by headcount)’ provided on page 128 of the 2021 Annual Report is defined. It should be clarified if this value includes Inuit employees hired from Nunavut’s Kitikmeot and Kivalliq regions as well as other locations.

Agnico Eagle Answer

The ‘Outside of Kivalliq’ category in Table 29 does not include Inuit employees hired from Nunavut Kitikmeot and Qikiqtani region. It includes Inuit employees hired from outside of Nunavut. In future Annual Report submission, Agnico Eagle will change the category in Table 29 from ‘Outside of Kivalliq’ to ‘Outside of Nunavut’ for better clarification.

Please see below a detailed breakdown of headcount data by employee location, Inuit and non-Inuit status and project.

Meliadine			
Employee Location	Inuit	Non-Inuit	Total
Kivalliq Community			
Arviat	7	0	7
Baker Lake	5	0	5
Chesterfield Inlet	3	0	3
Coral Harbour	14	0	14
Naujaat	3	0	3
Rankin Inlet	33	0	33
Whale Cove	1	0	1
Other Nunavut			
Kitikmeot	0	0	0



Qikiqtani			
Iqaluit	2	0	2
Other Canada			
Alberta	0	15	15
British Columbia	0	11	11
Manitoba	0	4	4
New Brunswick	0	25	25
Northwest Territory	0	0	0
Nova Scotia	1	5	6
Newfoundland & Labrador	0	6	6
Ontario	11	85	96
Prince Edward Island	0	1	1
Quebec	4	481	485
Saskatchewan	0	2	2
Other			
International	0	0	0
Grand Total	84	635	719

## CIRNAC-7 Counselling and Treatment Programs

### Comment

To support access to necessary treatment and counselling services for employee and family wellbeing, T&C 108 of the Amended Project Certificate states: *“The Proponent is encouraged to consider providing access to counseling and treatment programs for substance and gambling addictions, and programs which address domestic, parenting, and marital issues that could affect employees and/or their families.”*

The Project Certificate Concordance Table included as Appendix 41 to the 2021 Annual Report refers to section 12 of the Annual Report and related appendices for further information. CIRNAC has reviewed the referenced material and cannot find any mention of counseling and treatment programs specific to the topics identified in T&C 108.



### Recommendation

CIRNAC recommends that AEM confirm whether or not it is making available necessary treatment and counselling services for employee and family well-being as encouraged in T&C 108 of the amended Project Certificate.

### Agnico Eagle Answer

Agnico Eagle provides support to employee and family well-being through BCH and Homewood Employee Assistant Programs (EAP). In 2021, BCH was utilized 36 times by non-Inuit employees and zero times by Inuit Employees. The Homewood program was used seven times by non-Inuit employees and 23 times by Inuit employees. In addition, the clinic nurses were providing mental health support to the Nunavummiut employees during their return-to-work re-integration.

In future Annual Report submission, Agnico Eagle will ensure to provide updates on the accessibility of counselling and treatment programs.



## Fisheries and Oceans Canada (DFO)

### DFO-1 Effects Monitoring

#### DFO-1.1

##### Comment

DFO has concerns regarding the increasing trend in productivity, increase in metals in the sediment, and change in invertebrate density in the East Basin of Meliadine Lake, as well as changes in fish sizes relative to previous years' sampling. Agnico Eagle has stated that it is unclear if the increased productivity trend in the East Bay is natural or mine influenced, but it seems unlikely that increases in productivity are not related to effluent discharge. Although the AEMP has not noted any adverse effects to aquatic life due to the effluent releases, DFO is concerned with cumulative impacts and the long-term potential impacts on fish and fish habitat.

##### Recommendation

DFO recommends the monitoring program is revisited to ensure that potential changes to fish and fish habitat are effectively monitored and potential mitigations can be implemented to avoid adverse impacts to the aquatic environment, as necessary.

##### Agnico Eagle Answer

The AEMP is an adaptive program and results from previous cycles are used to make informed and timely changes to the study design (known as the AEMP Design Document). For example, the most recent update to the AEMP Design Document that was submitted with the 2021 Annual Report formally added the phytoplankton study as a core component of the AEMP. Prior to 2021, the phytoplankton study was classified as a "special study" rather than a "core component" of the AEMP like water quality monitoring (annual) or benthic invertebrate community sampling (3-year cycle). The AEMP was revised because there is some evidence, albeit inconclusive, that the East Basin is becoming more productive. The increasing trend in chlorophyll-a is the most compelling line of evidence that effluent is causing an increase in primary productivity in the East Basin. However, the benthic invertebrate community and fish population data from the 2021 monitoring program do not show evidence of nutrient enrichment consistent with effluent as the primary cause. A brief summary of the benthic invertebrate and fish population data (emphasis on Lake Trout) is presented below.

The change in invertebrate density was cited by DFO as one line of evidence for increased primary productivity caused by effluent. However, the increase in density observed at MEL-01 in 2021 compared to previous years was also observed at the reference areas (MEL-03 and MEL-05) and the mid-field exposure area (MEL-02). Higher invertebrate density throughout Meliadine Lake points to factors other than effluent as the underlying cause of the change. The salient point here is that the pattern and magnitude of change in density from year-to-year is similar among the various study areas. Benthic invertebrate community density can be highly variable within and



between stations, as well as between years as we have observed in the long-term benthic invertebrate community monitoring program for the Meadowbank Core Receiving Environment Monitoring Program (2006-2021). Based on the results presented in the 2021 AEMP, no changes to the study design for the benthic invertebrate community monitoring program are required in terms of the areas sampled (Near-field, mid-field, and two reference areas) or the frequency of monitoring (3-year cycle).

The Lake Trout study for the 2021 AEMP compared changes in Lake Trout health endpoints over time in Meliadine Lake (2015 vs 2021). The results indicated that effluent may be having a stimulatory effect on Lake Trout growth, but because external reference areas were not included in the AEMP study design, we cannot determine if the observed changes were caused by exposure to effluent, natural changes in the Lake Trout population, or a combination of natural and mining-related factors. The main limitation of the “before-after” study design is it assumes that reference lakes would not have changed in a similar fashion (Smokorowski and Randall, 2017). For this reason, two external reference lakes were included in the EEM study design that was submitted to ECCC for review in March 2021 (Azimuth and Portt, 2021). Including external reference areas in the assessment provided a clearer understanding of whether Lake Trout in Meliadine Lake are currently different than Lake Trout in unimpacted lakes in the region. In general, Lake Trout from Meliadine Lake were longer and heavier at a given age than Lake Trout collected from either Peter Lake or Atulik Lake. Furthermore, Lake Trout collected from Meliadine Lake also tended to have heavier livers than those collected from Atulik Lake, when adjusted for either total body weight or fork length. The magnitude of the difference between Meliadine Lake and the reference lakes was less than the critical effects sizes (CES) put forward by Environment Canada in the Technical Guidance Document (Environment Canada, 2012). As a reminder, a CES is a threshold above which an effect may be indicative of a higher risk to the environment. Because the magnitude of the difference was less than the CES, the conclusion from the EEM program is that there were no effluent-related effects to Lake Trout. The same conclusion was arrived at for the Threespine Stickleback study in 2021.

The multiple control-impact study design for the Cycle 2 EEM Lake Trout study provided valuable information about potential differences in Lake Trout endpoints among exposure and reference areas. The next iteration of the AEMP Design Document will likely incorporate external reference lakes into the study design in an effort to harmonize the AEMP and EEM program for assessing the effect of effluent on Lake Trout in Meliadine Lake.

## **DFO-1.2**

### Comment

DFO has concerns regarding the efficacy of the Marine Mammal Observations protocol to detect marine mammals and avoid impacts from shipping.

### Recommendation



DFO recommends that Agnico Eagle meets with DFO to discuss the monitoring effort for Marine Mammal Observations to ensure the robustness of the survey design.

#### Agnico Eagle Answer

Agnico Eagle thanks DFO for their comment and looks forward to meeting with DFO to discuss the monitoring effort for Marine Mammal Observations to ensure the robustness of the survey design.

### **DFO-2 Compliance Monitoring**

#### **DFO-2.2**

#### Comment

In 2021, Agnico Eagle expressed concern for safety during operations due to steep slopes at the Tiriganiaq 01 pit and the close location to existing natural ponds. As a result of those concerns, Agnico Eagle proposed to dewater the ponds and modify the slopes in Tiriganiaq 01 pit for safer working conditions. The safety concerns are not identified in the 2021 Annual Report.

#### Recommendation

DFO recommends that the monitoring that identified the safety concerns and the subsequent plan to address the concerns be added to the Annual Report.

#### Agnico Eagle Answer

Agnico Eagle thanks DFO for their comment and will provide a short memo to this effect by September 12th, 2022.