



July 5<sup>th</sup>, 2019

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**Re: Agnico Eagle's response to Meadowbank (03MN107) and Whale Tail (16MN056) 2018 Annual Report comments**

Dear Erin Reimer,

The following information are intended to address the regulator's comments regarding the Meadowbank (03MN107) and Whale Tail (16MN056) 2018 Annual Report:

- Government of Nunavut – May 27, 2019: Comment Request for Agnico Eagle Mines Ltd.'s Meadowbank Gold Mine Project 2018 Annual Monitoring Report (NIRB File No. 03MN107)
- Fisheries and Oceans Canada – May 27, 2019: Comment Request for Agnico Eagle Mines Limited's Meadowbank Gold Mine Project and Whale Tail Pit Project 2018 Annual Monitoring Report
- Crown-Indigenous Relations and Northern Affairs Canada – May 27, 2019: Comment Request for Agnico Eagle Mines Limited's Meadowbank Gold Mine Project and Whale Tail Pit Project 2018 Annual Monitoring Report
- Kivalliq Inuit Association – May 27, 2019: Technical Review of Meadowbank Gold Project 2018 Annual Report
- Environment and Climate Change Canada – May 27, 2019: 03MN107, 16MN056 – Agnico Eagle Mines Ltd. – Meadowbank Gold Mine and Whale Tail Pit Projects – 2018 Annual Report
- Transport Canada – May 28, 2019: 2018 Annual Monitoring Report Comments for the Meadowbank Gold mine and the Whale Tail Project

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

Regards,



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## **1 Government of Nunavut (GN)**

### **1.1 Raptor Monitoring Around Whale Tail Site and Haul Road**

**Term and Condition:** Nos. 28, 36 (Project Certificate 008)

**References:** Appendix 45 (Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report) section 12.4 – Methodology; 2018 Annual Report section 8.18.1.6 - Raptor Nest Survey, section 8.18.1 - Wildlife Monitoring Meadowbank and Whale Tail Site, section 12.7 Accuracy of Impact predictions; Nunavut Impact Review Board (NIRB). (2017). Final Hearing Report, Agnico Eagle Mines Ltd Whale Tail Pit Project, NIRB file No. 16MN056, appendix B; Terrestrial Ecosystem Management Plan, version 6, section 3.7.2.1 – Nest Monitoring and section 3.7.3.1 – Nest Monitoring

**Concern:** Raptor monitoring, as reported in the 2018 Annual Report (2018 Report), is inconsistent with the objectives specified in the Terrestrial Ecosystem Management Plan (TEMP). The GN is concerned that certain raptor-related aspects of the TEMP are not being implemented as required under Terms and Conditions Nos. 28 and 36 (NIRB Project Certificate 008), and that the current monitoring does not have the power to detect and mitigate Project-related effects on raptor nesting success.

#### Nest Surveys

The 2018 Report indicates that surveys to locate active raptor nests in the vicinity of the Whale Tail Pit and Haul Road were not conducted in 2018. The report also notes that:

“Raptor nests in the Whale Tail Pit and Haul Road study area were previously identified by researchers from the University of Alberta during the environmental assessment process (i.e., 2015 to 2017)... Nest monitoring was not conducted in the Whale Tail area in 2018 because none of the identified active nests are in close proximity to project activities and facilities.” (AEM 2019, appendix 45, section 12.4)

The decision not to conduct raptor nest surveys and subsequent nest monitoring at the Whale Tail Pit and Haul Road is inconsistent with the Project’s TEMP which indicates that:

"For new development sites, suitable habitat within 1.5 km of the sites will surveyed on foot for active Raptor nests." (TEMP version 6, section 3.7.2.1).

The TEMP also indicates that there will be nest monitoring for nests located within the active footprint and within 1.5 km of Project facilities (TEMP v6 - fig 14). Nest management plans,



including the application of no-work distance buffers will be applied to nests in “areas of concern” (TEMP version 6, section 3.7.3.1).

2018 was a construction year for the Whale Tail Pit and Haul Road involving road construction, development and use of quarries and the construction of mine site infrastructure. Raptor nest surveys should have been conducted at these sites to identify nests requiring subsequent nest monitoring and nest management plans. The report seems to rely on the assumption that nest surveys conducted in 2015 to 2017 were sufficient to predict the location of active nests in 2018. The GN is concerned that evidence to validate this assumption is not presented in the 2018 Report. Furthermore, it is noted that raptor monitoring in 2018 in the vicinity of other components of the Project led to the discovery of 5 previously undocumented nests (AEM 2019, section 8.18.1.6). The possibility thus exists that there were active nests in the vicinity of the Haul Road and Whale Tail pit that should have been monitored and managed in 2018.

#### Impact Predictions and Thresholds

The impact prediction for raptor nests was that nest failures would not be caused by mine-related activities (AEM 2019, appendix 45, section 12.7). The monitoring threshold for this prediction is one Project-related nest failure per year and the 2018 Report concludes that this threshold was not exceeded in 2018 (AEM 2019, appendix 45, table 12.3). The GN is concerned that this conclusion is not supported by evidence. The results of raptor monitoring programs, as presented in the 2018 Report, do not appear to be designed to detect Project-related nest failures. The 2018 Report indicates that:

“Seven active Peregrine Falcon (*Falco peregrinus*) nests were observed and monitored at quarry sites along the AWAR in 2018, with successful nesting confirmed at three nests.” (AEM 2019, section 8.18.1)

However, there is no evidence to determine whether the failure of 4 of the 7 nests were Project-related or not. The study design does not appear to support analysis that would allow detection of Project-related nest failures; for example, by examining nest success as a function of intensity of Project-related disturbance. The GN maintains that the 2018 Report’s conclusions regarding nesting success are unsubstantiated.

#### Nest Management Plans

The 2018 Report indicates that:





“Raptor nest management plans were not warranted at any of the active nest sites as no project-related effects on raptor nesting success were observed.” (AEM 2019, section 8.18.1)

The approach to nest management presented in the 2018 Report is contrary to the approach outlined in the TEMP. The purpose of a nest management plan is to prevent effects on nest success. To be effective, a plan should thus be in place prior to, and regardless of, effects being observed. The TEMP specifies that nest management plans, including the potential application of no-work distance buffers will be applied to nests in “areas of concern” (TEMP version 6, section 3.7.3.1). It does not specify that an effect on nesting success must be observed before a plan is developed.

The GN finds the reported approach to raptor nest management troubling and is concerned that in addition to going undetected (see section above entitled Impact Predictions and Thresholds), Project-related effects on raptor nesting may be going unmitigated.

**Recommendation 1:** The GN offers the following recommendations to the Board with respect to this issue:

- That the Proponent provide evidence to support the assumption that raptor nest surveys in 2015 to 2017 were an accurate predictor of the locations of active nests in 2018 in the vicinity of the Haul Road and Whale Tail Pit.

**Agnico Eagle’s Response:**

*The raptor nest surveys from 2015 to 2017 were an accurate predictor of the locations of active nests in 2018. Important considerations were:*

- 1) none of the previously identified active nests were within 1 km of the construction area of the Whale Tail Pit area or Whale Tail Haul Road;*
  - 2) the suitability of nesting habitat in the vicinity of the Whale Tail Pit and Haul Road had not changed substantially by 2018 because quarries, borrow pits, and mine pits were in the development phase; and*
  - 3) extensive disturbance and construction activity in 2018 reduced the possibility that new nests would be established.*
- That the Proponent explain why raptor nest surveys were not conducted in 2018 in the vicinity of the Whale Tail Pit and Haul Road construction activities, as required by the TEMP.



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### **Agnico Eagle's Response:**

*Newly established raptor nests would have been identified through several monitoring approaches, including: 1) wildlife surveys along the Whale Tail Haul Road and Quarries; 2) Height of Land (HOL) surveys; 3) Whale Tail on-site and Haul Road freshet monitoring; and 4) on-site environmental monitoring. Environmental staff conducting these surveys are also tasked with identifying raptor nests. Any documented raptor activity would have been followed up with dedicated raptor nest surveys, and if applicable, a comprehensive site-specific raptor nest management plan.*

- That the Proponent clarify whether raptor nest surveys will be conducted in the vicinity of all new sites of development prior to any activity occurring.

### **Agnico Eagle's Response:**

*As indicated above, raptor activity is identified through a number of monitoring approaches that are also focused on new development areas. In spring 2020, a dedicated raptor nest survey will be conducted to determine whether raptor nesting has been initiated in the vicinity of the Whale Tail Pit and Haul Road.*

*It's also part of Agnico's practices to conduct nest monitoring in quarries prior to allow activities in quarries.*

- That the Proponent clarify how the raptor nest monitoring program, as currently designed, is able to distinguish between WT Project-related and other effects on nest success in-order to reach the conclusion that in 2018 there were no WT Project-related nest failures.

### **Agnico Eagle's Response:**

*The current raptor nest monitoring program involves weekly monitoring of identified raptor nests, but ensures that monitoring does not disturb nesting birds. Agnico's approach, and one recommended by raptor specialist Alistair Franke, is to restrict all activity such as vehicle movements, blasting, and raptor nest monitoring in the vicinity of active nests. Although raptor nest monitoring does provide information on the success of most nests, the causes of nest-failures (e.g., predation, weather, food supply, or human disturbance) are difficult to determine.*

- That the Proponent design and implement a raptor monitoring program that has the statistical power to monitor nest success relative to the established threshold of "one Project-related nest failure per year" or revise the threshold and study design in consultation with the Terrestrial Advisory Group.



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**Agnico Eagle's Response:**

*A raptor nest monitoring program that has the statistical power to monitor nest success but does not contribute to nest disturbance requires further discussions within the TAG and with raptor experts such as Alistair Franke. The current approach of restricting human disturbance and minimizing impacts from nest monitoring may be the preferred choice.*

- The GN requests that the Proponent fully implement raptor mitigation as specified in the TEMP. This includes the development of management plans for nests in areas of concern, regardless of whether effects on the success of those nests have been observed.

**Agnico Eagle's Response:**

*Agnico brings in subject-based experts, such as Alistair Franke, to provide advice on nest-specific management approaches. Where mining activity is unavoidable in close proximity to active nests, site-specific nest management plans will be developed to outline mitigation strategies such as timing windows and setbacks. For nests in quarries along the AWAR and WTHR, mining activity (e.g., blasting, movement of materials) is restricted; therefore, site-specific nest management plans are not necessary.*

- The Proponent should ensure that the next revised version of the TEMP will reflect the following commitment made during NIRB's review of the WT Project:

*"The proponent shall establish automatic minimum no-disturbance buffers around all raptor nests located in proximity to the Project. Project activities, including the operation of vehicles, heavy equipment, aircraft and blasting, shall be prohibited within these buffers unless an exception is specified within a nest-specific management plan that has been reviewed and approved by the GN, subject matter experts and other relevant parties. The size of minimum, no-disturbance buffers shall be based on the BC Guidelines for Raptor Conservation or similar guidelines as recommended by the Project's TAG." (commitment #32, NIRB 2017, appendix B).*

**Agnico Eagle's Response:**

*Agnico acknowledge GN's comment and will ensure that the next revised version of the TEMP reflects this commitment.*

- In the 2019 Annual Report, the Proponent should provide details of the automatic no disturbance buffers established around each active nest and any modifications to these buffers that were applied as part of an approved nest management plan.



**Agnico Eagle's Response:**

*Agnico agrees to provide details on the automatic no-disturbance buffers and other mitigation approaches for each active raptor nest in the 2019 annual report.*

**1.2 Reporting of Caribou Monitoring and Mitigation Activities: Consistency with the Terrestrial Ecosystem Management Plan (TEMP)**

**Term and Condition:** No 28 (Project Certificate 008)

**References:** Appendix 45 (Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report), section 3.2 – Objectives, section 4.2 – Objectives, section 6.0 – Caribou Satellite Collaring Program, section 3.6.5 – Road Related Mitigation; and Terrestrial Ecosystem Management Plan (TEMP), version 6

**Concern:** Some caribou monitoring and mitigation activities reported in the 2018 Annual Report (2018 Report) do not align with thresholds and seasons used in the Terrestrial Ecosystem Management Plan (TEMP). This makes it challenging for reviewers to understand how the Project's caribou protection measures are being implemented and whether the measures are likely to be, or are being, effective in minimizing Project effects on caribou.

The 2018 Report and the TEMP do not align in several areas with respect to reported versus planned caribou monitoring and mitigation. This makes it hard for reviewers to understand how monitoring results compare to impact predictions and how caribou protection measures are being implemented relative to the TEMP.

**Seasonal Windows**

The proposed intensity of caribou monitoring and mitigation, as specified in the TEMP, varies according to defined seasonal windows (e.g. Figures 6 – 9, TEMP version 6). These windows correspond to seasons used for effects assessments in previous environmental impact statements for the Project. In several parts of the 2018 Report, results relating to caribou are reported using seasons that differ from those used in the TEMP. For example:

- Road surveys are a key component of the TEMP used for monitoring caribou and supporting mitigation, including implementation of the caribou decision trees (Figures 6 – 9, TEMP version 6). Tables 3.1, 3.2 and 3.5 of the 2018 Report (AEM 2019, appendix 45), which tables summarize the frequency and details of road surveys conducted in 2018, use seasons which differ from the seasons used in the TEMP for caribou monitoring and mitigation.
- The 2018 Report summarizes the results of the caribou satellite collaring program, including information on the seasonal movements of caribou in relation to the Project (AEM 2019,



appendix 45, section 6). The seasons used to present these results differ from the seasons used in the TEMP.

Other sections of the Annual Report provide details of the individual surveys or mitigation measures for caribou but do not provide a summary according to the seasonal windows used in the TEMP for caribou monitoring and mitigation. For example:

- The 2018 Report summarizes road restrictions implemented in 2018 for mitigating Project effects on caribou (AEM 2019, appendix 45, section 3.6.5, tables 3.7 – 3.9). A useful addition to this section would be summaries according to season.
- Similar seasonal summaries would be useful for activities such as height-of-land surveys, mine site surveys, pre-blasting surveys.

#### Monitoring Thresholds

The 2018 Report specifies the following Project-effect thresholds for caribou monitoring:

“Evaluate whether road-related operations preclude Caribou from using suitable habitats beyond 1,000 m. The threshold level along the roads is unnatural Caribou use patterns beyond 1,000 m”. (AEM 2019, appendix 45, section 3.2)

And

“Evaluate whether mine-related construction and operation activities preclude Caribou from using suitable habitats beyond 500 m (considered to be an average across various disturbance types) of mine buildings, facilities, and roads. Threshold level within mine facilities is unnatural Caribou use patterns beyond 500 m. The threshold level along roads is unnatural Caribou use patterns beyond 1,000 m (also see Section 3)”. (AEM 2019, appendix 45, section 4.2)

And

“Disturbance Mine-related construction and operation activities will not preclude Caribou and Muskoxen from using suitable habitats beyond 1,000 m of the AWAR.” (AEM 2019, appendix 45, table 3.12)

The 2018 Report states that both of these thresholds were exceeded. The GN notes that none of these thresholds are included in the TEMP (version 6) and quantitative analyses to assess monitoring results relative to these thresholds are not presented in the 2018 Report.



**Recommendation 2:** The GN offers the following recommendations to the Board with respect to this issue:

1) For future Annual Reports, the Proponent should develop a format for caribou-related components that is aligned with the TEMP with respect to planned monitoring and mitigation. This should include summaries, according to seasons, defined for caribou in the TEMP, for: (1) road, mine site, height-of-land and pre-blasting survey effort. Tables containing dates of individual surveys should be included as appendices; (2) mitigation measures such as road closures, mine site work stoppages, blasting delays, as specified in caribou decision trees in the TEMP (Figure 6 to 9, TEMP, version 6) and (3) monitoring of zone-of-influence, movements and caribou group size observations.

**Agnico Eagle's Response:**

*For the 2019 report, data summaries for various surveys, mitigation measures, and monitoring will be organized by Caribou seasons as defined in the TEMP. For clarity, a discussion on the differences between the Caribou seasons defined in the TEMP and those recognized by the GN will be included in the 2019 annual report.*

2) Currently, caribou-related are elements scattered throughout the 2018 Report, in some instances presented with results for other species. For future Annual Reports, all caribou elements should be presented in a single comprehensive section covering the implementation and effectiveness of the Project's caribou protection measures.

**Agnico Eagle's Response:**

*Although the general structure of the 2018 annual report will be retained for the 2019 report, an additional section will be included that integrates the Caribou elements found in various sections of the report.*

3) Monitoring thresholds used in the Annual Report for caribou should be the same as those established in the TEMP.

**Agnico Eagle's Response:**

*The Caribou monitoring thresholds described in the 2018 report are an artefact of earlier versions of the TEMP and will be removed for the 2019 report.*

### **1.3 Road Surveys for Wildlife Along the Whale Tail Haul Road**

**Term and Condition:** No 28 (Project Certificate 008)

**References:** Appendix 45 (Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report), section 3.2 – Objectives, section 3.6.5 – Road Related Mitigation, section 3.6.4 - Whale



Tail Haul Road Surveys; Terrestrial Ecosystem Management Plan (TEMP), version 6 section 3.2.1  
– Road Surveys

**Concern:** A primary objective of road surveys is to support adaptive management, such as road closures during peak caribou migration periods. In 2018, road survey effort along the Haul Road was limited to a single survey during the spring caribou migration. This level of effort is inconsistent with the Terrestrial Ecosystem Management Plan (TEMP) and raises concerns that caribou protection measures are not being fully implemented during a sensitive season for caribou interactions with the Project. The GN is concerned that the Proponent is non-compliant with Term and Condition No. 28 (NIRB Project Certificate 008).

As noted in the 2018 Report (2018 Report), the primary objective of road surveys for wildlife is to:

“Assess the need for adaptive mitigation, such as temporary road closures during peak Caribou migration periods.” (AEM 2019, appendix 45, section 3.2)

The Project’s TEMP, implemented in accordance with Term and Condition No. 28 (NIRB Project Certificate 008), indicates that road surveys will be conducted at least weekly and will increase in frequency when caribou are observed in the vicinity of the Project (TEMP, version 6, Table 14).

The 2018 Report states that:

“During Caribou peak migration, notices were sent to all road occupants (Appendix C), regulatory agencies, local groups and wildlife consultants were notified, and road survey efforts were increased to every two days.” (AEM 2019, appendix 45, section 3.6.5 Road-related Mitigation)

And

“The number of Whale Tail Haul Road surveys completed each season in 2018 is provided in Table 3.5. Surveys were conducted on average every 6.4 days from the beginning of the survey (19 April) to the end of the year). Survey frequency was highest in October (n=15) and November (n=11). The highest average numbers of Caribou were seen in April and October, which aligns with surveys results from the AWAR and the Vault Haul Road (Table 3.6).” (AEM 2019, appendix 45, section 3.6.4)

The GN notes the following concerns with respect to the information provided within the 2018 Report about road surveys conducted in 2018:



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- The 2018 Report indicates that road surveys were increased to every 2 days during caribou peak migration (AEM 2019, appendix 45, section 3.6.5). Spring (April-May) is a migration period when caribou are expected to cross the Haul Road. However, table 3.5 indicates that only 1 survey was conducted along the Haul Road during this period (Appendix 45). This equates to 1 survey per 2 months, not 1 survey per 2 days. The 2018 Report does not explain or comment on this discrepancy.
- Spring (April and May) is a migration period during which caribou interactions with the Haul Road are expected to peak. Indeed, the report indicates that the highest average numbers of caribou were seen in April (AEM 2019, appendix 45, section 3.6.4). The 2018 Report does not explain or comment on why only a single survey was conducted along the Haul Road during this peak migration period. According to the TEMP, at least 8 surveys should have occurred during this period regardless of whether caribou were observed in the vicinity of the Haul Road. Comparison of data within the 2018 Report (Appendix 45, tables 3.1, 3.2 and 3.5) shows that 12.5% and 16.5% of road survey conducted along the All-Weather-Access-Road (AWAR) and Vault Road, respectively, were conducted in the spring (April-May). In comparison, 3% of surveys conducted along the Haul Road were conducted along the Haul Road were in spring.
- The TEMP indicates that the minimum level of road survey effort, regardless of whether caribou are observed, will be 1 survey per week and will increase when caribou are present (TEMP, version 5, section 3.2.1). In 2018, 41 road surveys (average of 1 per 8.7 days) were conducted along the Haul Road. This is less than the minimum the TEMP provides for.

The GN is concerned that caribou protection measures as detailed in the TEMP are not being properly applied to the Haul Road. One of the primary triggers for implementing adaptive management, such as road closures, is the detection of caribou in the vicinity of the Road during road surveys. If these surveys are not being conducted, mitigation to protect caribou is not being applied. The Haul Road will be the most intensively used WT Project road. As such, caribou protection measures along the Haul Road must be applied fully. The fact that only 1 road survey was conducted along the Haul Road in spring 2018 is particularly concerning given the 2018 Report's conclusion that Project roads are deflecting caribou and causing sensory disturbance that exceeds monitoring thresholds (AEM 2019, appendix 45, table 3.12).

Overall, survey effort to support caribou protection measures was unacceptably low in 2018; below the minimums specified in the TEMP for each type of survey. The minimum survey effort specified in the TEMP have not been increased in accordance with commitments made by AEM during the NIRB's review of the Whale Tail Project.





**Recommendation 3:** The GN offers the following recommendations to the Board with respect to this issue:

- That the Proponent should explain why only a single road survey was conducted along the Haul Road in April and May.
- That the Proponent should explain the apparent discrepancy in information provided in the 2018 Report indicating that roads surveys during peak migration were increased to every 2 days versus the contents of table 3.5 (Appendix 45) which indicates that a single survey was conducted along the Haul Road during the spring migration.
- That the Proponent should explain why a total of 41 road surveys were conducted along the Haul Road in 2018 in comparison to the minimum of 52 surveys (1 per week) indicated in the TEMP.

**Agnico Eagle's Response:**

*The Whale Tail Exploration Road was constructed between February 2016 and August 2017, and widened to a Haul Road standard between April and November 2018. Several factors, including the upgrade from exploration to haul road, accessibility and safety of the road during construction along with the availability of a Baker Lake Wildlife Officer, lead to a delay in mobilizing the road surveys in 2018. Furthermore, in Agnico's belief, the official wildlife survey was to be conducted during on the haul road (operation phase) and not necessarily on the Exploration Road, and thus, the survey started in April. In response to Caribou presence within the Whale Tail study area in April 2019, road survey frequency was increased substantially resulting in more than 30 road surveys.*

*The methodology describe in the 2018 Wildlife Report Section 3.3 refer to the AWAR, Vault Road and WTHR: '[...] systematic ground surveys are ongoing over the operation phase of the mine and are scheduled to be conducted a minimum of once per week throughout the year, twice per week during Caribou migration (i.e., contingent on weather, road access and personnel availability), and every two days if Caribou presence triggers are surpassed'. Agncio should have precise that the above statement does not apply in 2018 to the WTHR. As describe above, a number of factors contributed to the slow mobilization of road surveys along the Whale Tail Haul Road in 2018 but these issues had been addressed by the second half of 2018. Agnico is now fully applying the TEMP Version 6. For example, in April and May 2019, road surveys were conducted on an almost daily basis along the Whale Tail Haul Road and already surpassed the minimum number of surveys required.*



#### **1.4 Adaptive Management Response to Exceedance of Caribou Disturbance Threshold**

**Term and Condition:** Nos 28 and 29 (Project Certificate 008)

**References:** Appendix 45 (Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report) Table 3.12 - Accuracy of Impact Predictions – Sensory Disturbance and Mortality along the AWAR, Vault Haul Road, and Whale Tail Haul Road, Table 6.1 - Accuracy of Impact Predictions – Satellite-collaring Data, Section 3.8 – Management Recommendations, Section 6.6 Results, Section 6.7 Caribou Migration Patterns

**Concern:** The 2018 Annual Report (2018 Report) claims success in managing Project roads to minimize effects on the movements of migrating caribou by application of Caribou Protection Measures (CMPs) within the Terrestrial Ecosystem Management Plan (TEMP). The GN maintains that this claim is not substantiated by the information presented in the report. Contrary to this claim, the 2018 Report concludes that Project effects on caribou movements exceeded the threshold level. The GN is concerned that this exceedance has occurred and could occur in future years to a greater spatial extent and/or intensity without adaptive management being implemented. The GN notes that the 2018 Report does not include discussion of an adaptive management response to this finding. Additionally, the 2018 Report does not present quantitative analyses of this effect, which could inform adaptive management, despite data for such analyses are being available.

The 2018 Reports states that:

“The AWAR, Vault Haul Road, and Whale Tail Haul Road survey data are important for documenting time periods when the area near the road is utilized by various wildlife species and for evaluating the need, if any, for implementing adaptive management (e.g., temporary road closures and radio announcements). Moreover, Caribou density can be compared graphically across years, which can be used to track changes in density and preferential migration corridors. The road sections with higher use are prioritized for temporary road closures, speed reductions or additional adaptive management strategies. The road survey data are used in conjunction with satellite-collaring and mortality data to successfully manage road operations during heavy wildlife use periods.” (AEM 2019, appendix 45, section 3.8)

The GN notes that this claim of success in managing Project roads to avoid or minimize effects on caribou is not substantiated by monitoring results or other evidence presented in the 2018 Report. Contrary to this claim, the 2018 Report concludes that the Environmental Impact Statement predictions and the monitoring threshold for sensory disturbance of caribou were



exceeded in 2018 (AEM 2019, appendix 45, tables 3.12 and 6.1). Migrating caribou appeared to exhibit significant deflection and delayed crossing in response to Project roads (AEM 2019, appendix 45, figures 6.7 and 6.8, sections 6.6 and 6.7).

It is also noted in the 2018 Report that the response to this exceedance was the implementation of adaptive management in the form of:

“Multiple road closures and notices. Use of Decision Tree for Management and Monitoring. Ongoing analysis by GN (in partnership with Agnico Eagle)” (AEM 2019, appendix 45, table 6.1)

However, the GN disagrees that this constitutes an adaptive response to exceedance of the monitoring threshold. The road closures and use of decision trees were existing measures in place at the time the effects (and exceedances) occurred in 2018. The effects on caribou movement occurred despite these measures being in place. Thus, they do not represent an adaptive response to what appears to be a failure of the Project’s CPMs. The 2018 Report does not discuss why the existing CPMs failed to prevent exceedance of the threshold. The 2018 Report does not assess whether the CPMs were properly implemented or whether certain aspects require improvement. Overall, the 2018 Report does not identify any new CPMs or other adaptive management measures beyond those presently specified in the TEMP. This leaves the GN concerned that similar effects on caribou movement will occur repeatedly in future years and may increase in spatial extent and intensity once the more heavily used of the Project’s roads (the Whale Tail Haul Road) begins its full operation in 2019. The GN finds this lack of adaptive response unacceptable.

The 2018 Report presents a qualitative description of Project effects on caribou movements (AEM 2019, appendix 45, section 6) including maps of the movements of collared individuals. The GN is concerned that the 2018 Report does not present quantitative analyses, pursuant to Term and Condition No. 28, when data on both caribou movements in the vicinity of roads and the monitoring and mitigation measures that were in operation over the same periods are available. This type of analysis could inform all parties regarding the magnitude of observed effects on caribou and facilitate a greater understanding of how existing CPMs are, or are not, working. This would ultimately allow for effective adaptive management.

The GN feels that it is prudent to undertake a detailed investigation on the possible reason for the observed exceedance of the caribou disturbance threshold. A possible reason could be the incomplete/inconsistent application of the Project’s Caribou Protection Measures along roads. Levels of caribou monitoring (i.e. road surveys and height-of-land surveys) implemented in 2018 were below the minimums specified in the TEMP. In addition, there were potentially some instances where the observation of large groups of caribou in 2018 should have triggered road



closures that did not occur. The combination of insufficient levels of monitoring and a failure to trigger road closures may account, to some extent, for the observed effects on caribou.

**Recommendation 4:** The GN offers the following recommendations to the Board with respect to this issue:

- That the Proponent should explain in detail what adaptive management measures (over and above existing caribou protection measures in the TEMP (version 6) will be taken in 2019 and in future years in response to the 2018 Report's finding that disturbance of caribou exceeded threshold levels. In particular, please explain how this finding will influence management of the Whale Tail Haul Road and any revisions to the TEMP that are proposed by the Proponent.

**Agnico Eagle's Response:**

*A number of adaptive mitigation strategies were implemented in spring 2019 in response to Caribou movements across the AWAR and Whale Tail Haul Road. Road survey frequency was increased to an almost daily basis, and road closures and/or road restrictions (e.g., light vehicles only) were implemented on numerous occasions. In addition, when applicable, lower speed limits were set and daily rides (e.g., crew changes, food deliveries etc.) were escorted by Environment Department and in collaboration with HTO and KIA. When necessary, Environment Department stopped convoys, sometimes for hours, to let Caribou pass undisturbed. These adaptive management strategies will be more clearly outlined, and linked to Caribou monitoring results, in the 2019 report.*

- That future Annual Reports include quantitative analyses of road effects on the movement and distribution of caribou that incorporate concurrent data on recorded traffic levels, caribou monitoring activities and road management measures that are implemented.

**Agnico Eagle's Response:**

*In the 2019 report, a clearer link will be made between monitoring results (i.e., movement and distribution of Caribou) and mitigation measures that are implemented (e.g., road management measures). Further, a comprehensive GN report (i.e., Kite et al.) on the effect of the AWAR and Whale Tail Haul Road on movements of collared Caribou should be finalized end of June 2019.*

## **1.5 Problem carnivores and project-related mortalities**

**Term and Condition:** No28 (Project Certificate 008)



**References:** Appendix 45 (Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report) section 4.5.5 - Predatory Mammal Deterrence and Protection, Table 4.1 - Wildlife Presence Requiring Action (from Appendix E), Table 4.3 - Summary of Deterrence Activities at the Meadowbank Mine and Whale Tail Sites from 2015 to 2018, Table 4.5 - Summary of Mine Site Wildlife Fatality Records for Caribou and Predatory Mammals (2007 to 2018), Table 4.6 - Accuracy of Impact Predictions – Mine Site Wildlife Disturbances; Terrestrial Ecosystem Management Plan (TEMP), version 6

**Concern:** The Project has had persistent problems with predatory mammals, such as wolves and wolverines. Based on the information provided in the 2018 Annual Report (2018 Report), it is evident that the Environmental Impact Statement (EIS) predictions regarding Project-related mortality of predatory mammals has been exceeded in 9 of the last 12 years. The GN is concerned that adaptive management is not being effectively applied to bring this mortality below predicted levels.

The 2018 Report summarizes Project interactions with predatory mammals such as wolves, bears and wolverine, including mortalities. The 2018 Report indicates that:

“Wolverines were regularly observed around the Meadowbank and Whale Tail sites primarily during the winter months in 2018 (see Table 4.2, Figure 4.1, and Appendix E). Deterrence actions, which followed the Wildlife Protection and Response Plan (Appendix C in 2018 TEMP), were required on 17 occasions primarily in January and February (Table 4.1). One Wolverine, which was not successfully deterred from the site was dispatched on 13 January (see Section 4.5.6.2 and Table 4.3). Well-defined food-handling practices and employee awareness programs have minimized Wolverine fatalities or Wolverine-human interactions; however, an increase in deterrence efforts in 2018 (see Table 4.3) will be tracked to determine whether the trend continues in 2019.

Wolves were also regularly observed around the Meadowbank and Whale Tail sites during the winter months in 2018 (see Table 4.2, Figure 1, and Appendix E). Deterrence actions were required on 14 occasions in January, February, April, and December (Table 4.1). One Wolf, which was not successfully deterred from the site, was dispatched on 25 January (see Section 4.5.6.2 and Table 4.3). Notices were sent on a weekly basis to Meadowbank employees regarding the presence of wildlife, waste management procedures, and requesting all sea cans and doorways be closed. An increase in deterrence efforts in 2018 (see Table 4.3) will be tracked to determine whether the trend continues in 2019.” (AEM 2019, appendix 45, section 4.5.5)

With respect to this section of the 2018 Report, the GN notes the following concerns:



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- In 2018, most of the interactions between the Project and wolves or wolverines that required actions such as use of deterrents or euthanasia occurred in winter (Dec-March) and spring (April) (AEM 2019, appendix 45, Table 4.1). The report does not explain why interactions peaked during this period, what specific attractants, if any, were present at the Project, and what adaptive management is planned to address the problem.
- The reference to Appendix E as a source of details regarding Project interactions with predatory mammals is incorrect. Appendix D appears to be the correct source.
- There are apparent inconsistencies between information provided in tables 4.1 and 4.3 versus the text in section 4.5.5 regarding the frequency of successful and unsuccessful deterrent actions and the dispatching of predatory mammals in 2018 (AEM 2019, appendix 45). For example, the unsuccessful deterrent actions for a wolverine and wolf on Jan 13 and 25, respectively, that are referred to in section 4.5.5 do not appear in table 4.1. Additionally, table 4.1 suggests that 2 wolves were not successfully deterred on February 23 and April 19. Section 4.5.5 does not mention whether these individuals were dispatched. The 2018 Report does not specify whether or not these animals were euthanized.
- Table 4.3 suggests that deterrent activities for wolf and wolverine have increased between 2015 and 2018. The report does not clarify whether this trend reflects increasing problems with these species or increasing deterrent efforts.

Table 4.6 of the 2018 Report (AEM 2019, appendix 45) indicates that Project-related mortality of predatory mammals in 2018 did not exceed the monitoring threshold. The GN notes the following with respect to this conclusion:

- The threshold presented in this table is “Destruction of two (2) problem Grizzly Bear or Wolverine per year.” This is different from the threshold specified in the Terrestrial Ecosystem Management Plan which is “Two individuals of the same species in a year” including wolverine, wolf and grizzly bear (TEMP version 6, table 18). Two wolves were dispatched in 2018 suggesting that the threshold was reached. Data presented in table 4.5 (AEM 2019, appendix 45) suggest that the Project has been at or above this threshold for wolves in 5 of last 12 years.
- The EIS predicted that “Predatory Mammals will not be killed as a result of Project activities” (TEMP version 6, table 18). Data presented in table 4.5 of the 2018 Report suggests that the Project has exceeded this prediction for 9 of the last 12 years including 2018 (AEM 2019, appendix 45).

### **Agnico Eagle’s Response:**

*Agnico would like to add regarding KIA’s concern of Table 4.6 of the 2018 Report which indicates that Project-related mortality of predatory mammals in 2018 did not exceed the*



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*monitoring threshold. Agnico will like to precise that the original TEMP (2006), which was used up to and including the 2017 annual report, did not include Wolf as a species with a mortality threshold (refer to Section 4.5.2.1, TEMP 2006). Version 5 of the TEMP (2018), which was used for the 2018 report, did include Wolf as a species with a mortality threshold but this was overlooked and inadvertently excluded from the 2018 report. Therefore, the threshold for Wolf mortality may have been surpassed in 2018, although one of the wolves may have died of natural causes (i.e., was not dispatched by Environment crew). The mortality threshold for Wolves will be corrected in the 2019 report. Wolves were only included as species with a mortality threshold in 2018, when the threshold may have been surpassed. Other years where the mortality threshold was exceeded were 2011 (1 Wolverine – note that the threshold for Wolverine was 1 up to and including the 2017 annual report) and 2013 (1 Wolverine).*

Overall, the 2018 Report highlights that the Project has a persistent, if not increasing problem, with predatory mammals. The 2018 Report does not indicate what additional adaptive management will be taken in 2019 to address this problem.

**Recommendation 5:** The GN offers the following recommendations to the Board with respect to this issue:

1) That the Proponent should clarify apparent discrepancies between table 4.1 and section 4.5.5 of the Annual Report (AEM 2019, appendix 45) in the reporting of predatory mammal interactions with the Project, as noted above.

**Agnico Eagle's Response:**

*Unsuccessful deterrence indicates that deterrence activities did not result in predatory mammals immediately leaving the mine site; however, these individuals eventually left the mine site on their own accord and did not need to be dispatched. For the 2019 report, further details will be provided on the circumstances around and management actions taken for individuals that were not successfully deterred.*

2) That the Proponent should explain: (i) why interactions in 2018 with wolf and wolverine peaked from Dec to April; (ii) what attractants, if any; were present at the Project during this period; (iii) what adaptive management is planned to address the problem.

**Agnico Eagle's Response:**

*Several factors may explain increased Wolf and Wolverine presence in 2018: 1) Since Wolf and Wolverine population size is cyclical, increased numbers may have been present in the region in 2018; 2) potential limited prey availability may have led to an increase in*





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*attraction to the mine site; and 3) attractants may have been more readily available at the mine site in 2018. Waste management at site is in constant monitoring and is addressed by increasing the level of staff training. Employees on site are reminded regularly on proper waste segregation through departmental toolbox meetings and site wide communications. This is to stress the importance of maintaining a proper waste management. In 2018, Agnico continued to conduct weekly visits of the different infrastructures for waste management as the incinerator, landfill, waste container and all areas around site to assess the performance of the waste management. These practices will be continued in 2019.*

3) That the Proponent should clarify whether the trend of increasing deterrent actions against wolf and wolverine (2015-2018) reflects increasing problems with these species or increasing deterrent efforts. Please present available evidence.

**Agnico Eagle's Response:**

*Please refer to answer above.*

4) That the Proponent should indicate what additional adaptive management will be taken in 2019 to address what appears to be a persistent, if not increasing, problem with predatory mammals.

**Agnico Eagle's Response:**

*Please refer to answer above.*

5) That the Proponent should retain an independent specialist to conduct a site inspection and audit of the Project to recommend additional adaptive management for predatory mammals, where appropriate. That the results of this audit be submitted to NIRB.

**Agnico Eagle's Response:**

*Agnico acknowledges GN's recommendation and will evaluate it further.*

### 1.6 Hunter Harvest Study

**Term and Condition:** Nos. 28 (Project Certificate 008), and 54(e) (Project Certificate 004)

**References:** Meadowbank Gold Project 2018 Annual Report, section 8.18.1.2 - Harvest Study Results; Appendix 45 (Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report), section 10.1 – Overview, section 10.1 – Objectives; Government of Nunavut (2017). Technical review comments for the NIRB's review of the Whale Tail Pit Project.

**Concern:** The 2018 Annual Report (2018 report\_ indicates that the Hunter Harvest Study (HHS) will be re-started in 2019. The study's design will be similar to previous years. This design will not





address previous concerns with the HHS or fulfill commitments for harvest data collection made in the Project's Terrestrial Ecosystem Management Plan (TEMP). The GN suggests that failure to fully implement the TEMP will be non-compliant with Terms and Conditions Nos. 28 (NIRB Project Certificate 008) and No. 54(e) (NIRB Project Certificate 004).

The 2018 Report discusses progress in restarting the Hunter Harvest Study noting that:

The Proponent had planned to create a Hunter Harvest Study (HHS) Committee in 2018 but did not citing:

- Third party projects in the community causing confusion;
- Limited resource availability; and
- Tight timelines for implementation of alternative data collection methods (AEM 2019, section 8.18.1.2)

The Proponent has outlined its future plans for the HHS as follows:

"Agnico Eagle is already started planning the 2019 HHS for March 2019. The study approach will be similar to previous years but suggestions and guidance received during the consultation period will be incorporated into the study. Study results for 2019 will be presented in the 2019 annual report.

This HHS approach will include:

1. Liaising with HTO members, the community liaison officer, and other stakeholders with an interest in the Baker Lake Hunter Harvest Study (Q1 2019, completed);
2. Preparing and distributing 2019 and 2020 hunter harvest calendars (Q1 2019, completed);
3. Building relationships with hunters/participants in the HHS and corresponding on a quarterly or more frequent basis (Quarterly);
4. Conducting frequent field visits in 2019 to distribute calendars, sign up hunters/participants, promote the study, and build relationships in the community (all year);
5. Conduct field visits in early 2020 to collect remaining 2019 data from participants, distribute prizes, hand out 2020 calendars, and identify other potential participants; and



6. Conduct preliminary data management, analysis, and writing for the 2019 annual report.

Moving forward Agnico Eagle intends to continue working with the GN, KIA and HTO to ensure a representative number of participants and long term success of the program. The HHS, including creel surveys, is implemented in 2019 with the collaborative approach.

f. Details of annual aerial surveys to be conducted” (AEM 2019, section 8.18.1.2)

The 2018 Report also indicates that

“Following consultation with the HTO, KivIA, GN, and other agencies in November 2016 (Winnipeg) and June 2017 (Ottawa), Agnico Eagle reinitiated the HHS in March 2019. The study approach will be similar to previous years but suggestions and guidance received during the consultation period will be incorporated into the study.” (AEM 2019, appendix 45, section 10.1)

The GN notes the following concerns with respect to re-starting the Hunter Harvest Survey (HHS) in 2019, as described in the Annual Report:

- The GN was not aware that a formal consultation period had been initiated and closed by the Proponent for a renewed HHS. The GN participated in meetings of the Terrestrial Advisory Group (TAG) at which the HHS was discussed. However, it was the GN’s understanding that a consultant had been hired by the Proponent to undertake a review of the study design to ensure study objectives will be achieved. As part of this review further discussion with the TAG was to occur.
- The GN is concerned that re-starting the HHS using the previous study design will not address past problems in interpreting and applying the results (e.g. GN 2017, Technical Comment 12). Notably, as stated in the 2018 Report, the objective of the HHS is to be achieved by estimating two key metrics one of which is:

“The total level (or an index of) Caribou, Muskox, and Wolverine harvest by residents of Baker Lake.” (AEM 2019, appendix 45, section 10.2)

It is unclear how re-starting the HHS using the previous design will allow estimation of this metric since this design, as acknowledged by the Proponent (see GN 2017, Technical Comment 12), did not previously allow estimation of this metric.

- The 2018 Report seems to suggest that development of a new strategy and study design for the HHS has been put on hold. It does not indicate how long this delay will be.



Overall, the GN is concerned that the TEMP's provisions for a HHS are not being implemented in accordance with Terms and Conditions Nos. 28 (NIRB Project Certificate 008) and 54(e) (NIRB Project Certificate 004).

**Recommendation 6:** The GN offers the following recommendations to the Board with respect to this issue:

- That the Proponent should explain in detail how the design of the HHS being employed in 2019 will permit estimation of the total level (or an index of) caribou, muskox, and wolverine harvest by residents of Baker Lake.

**Agnico Eagle's Response:**

*As has been conducted in previous analyses, the spatial distribution of hunting can be compared between years of the Agnico Eagle study and an earlier study by the NWMB (i.e., an index of harvest). Results to date indicate that a higher proportion of hunting has occurred in the vicinity of the AWAR since the road was built. A total level of harvest cannot be determined with the current study design; however, Agnico Eagle is open to discussing the feasibility of collecting additional data that permits an estimation of the total level of harvest.*

- That the Proponent should clarify whether a revised HHS strategy, including a revised study design for estimating the two key metrics specified in section 10.2 of the Annual Report (AEM 2019, appendix 45) will be developed, when this will be completed and the schedule for implementation.

**Agnico Eagle's Response:**

*The metrics currently part of the study design will still be used but Agnico Eagle is open to discussing with the TAG how study design can be refined to provide estimates of other key metrics.*

- That the Proponent should clarify whether a consultant is currently retained to undertake this HHS revision.

**Agnico Eagle's Response:**

*Gebauer & Associates has been retained to reinitiate the hunter harvest study and to implement new strategies, including increased participant/researcher contact and use of social media platforms.*

- That the Proponent should clarify what further consultations are planned regarding revision of the HHS including consultation with the TAG.



**Agnico Eagle's Response:**

*For the most part, the previous approach to the hunter harvest study is suitable for collecting harvest data and investigating mine-related effects. However, several modifications have been made, including: 1) increasing the amount of time researchers spend in the community interacting with participants; 2) building long-term relationships between participants and researchers; 3) increasing engagement on social media platforms such as Facebook; and 4) increasing incentives for participation in the study (e.g., prizes, draws, etc.). To date, 65 participants are part of the study and engagement is strong.*

*Agnico Eagle is open to discussing within the TAG what metric and/or change in data collection techniques would be appropriate and/or acceptable to the GN.*

## **1.7 Wildlife Monitoring and Mitigation for Blasting Activities**

**Term and Condition:** No 28 (Project Certificate 008)

**References:** Nunavut Impact Review Board (NIRB). (2017). Final Hearing Report. Agnico Eagle Mines Ltd. Whale Tail Pit Project. NIRB File No. 16MN056; Terrestrial Ecosystem Management Plan (TEMP), version 6

**Concern:** The Project's Terrestrial Ecosystem Management Plan (TEMP) specifies that blasting for mining and construction activities will be postponed when caribou are in the vicinity of the Project. This mitigation is supported by monitoring. The 2018 Annual Report (2018 Report) does not present information on implementation of monitoring and mitigation measures for wildlife that occurred in 2018 in relation to blasting activities. It is unclear whether these measures were implemented.

The TEMP specifies that blasting will be postponed when caribou are within a certain distance of a blast site (TEMP, version 6, figure 9 and table 6). This mitigation is supported by monitoring to detect the presence of caribou.

Additionally, in accordance with commitments made by the Proponent during NIRB's review of the Whale Tail Pit Project (WT Project) (NIRB 2017, appendix B), the WT Project's TEMP was to be revised to include:

- A provision for suspension of blasting activities at the Whale Tail site when caribou above the specified seasonal group size threshold are present within 4 km of the blast site. This provision shall apply year-round except during calving season when the buffer shall be increased to 5 km when cows with calves are present (Commitment 15);



- A provision for mandatory suspension of blasting when groups of muskox above the specified group size threshold are observed within 1km of blasting activities (Commitment 29); and
- The conduct of surveys prior to each blast to detect caribou and other wildlife within the no-blasting buffers specified in TEMP (Commitment 17).

The 2018 Report does not provide information on monitoring or mitigation that occurred in relation to wildlife and blasting activity. It is therefore unclear whether this part of the TEMP is being applied, as required under Term and Condition No. 28 (NIRB Project Certificate 008)

**Recommendation 7:** The GN offers the following recommendations to the Board with respect to this issue:

1) The Proponent should provide information on blasting activities that occurred along the Haul Road and at Project mine sites in 2018. This should include details (in table format, included with the Proponent's other responses to the GN and NIRB) of wildlife surveys that were conducted and mitigation measures for caribou and muskox that were applied with reference to the no-blasting buffers.

**Agnico Eagle's Response:**

*The 2019 Annual report will provide more details on the surveys and mitigations measures adopted in relation to blasting activities.*

## **1.8 Terrestrial Ecosystem Management Plan**

**Term and Condition:** No 28 (Project Certificate 008)

**References:** Meadowbank Gold Project 2018 Annual Report, section 8.18 – Terrestrial Ecosystem Management Plan; Government of Nunavut (2017). Final written submission for the NIRB's review of the Whale Tail Pit Project; Terrestrial Ecosystem Management Plan (TEMP), version 6; Nunavut Impact Review Board (NIRB). (2017). Final Hearing Report. Agnico Eagle Mines Ltd. Whale Tail Pit Project. NIRB File No. 16MN056

**Concern:** Since issuance of the certificate for the Approved Project (NIRB Project Certificate 008), the Terrestrial Ecosystem Management Plan (TEMP) has not been updated to reflect some of the commitments made regarding caribou mitigation measures during the final hearing for the Whale Tail Pit project. Many of these commitments were intended to enhance the protection measures employed to mitigate Project effects on caribou. The GN is concerned that the Proponent is accordingly not compliant with Term and Condition No. 28 (NIRB Project Certificate 008).



Term and Condition No. 28 (NIRB Project Certificate 008) states that:

“The Proponent shall maintain a Terrestrial Ecosystem Management Plan (TEMP) throughout all phases of the Project. The Plan shall include detailed monitoring, mitigation, and adaptive management measures for wildlife, with consideration for each Project activity predicted to affect wildlife, and with inclusion of specific triggers for mitigation and adaptive management intervention. The TEMP shall demonstrate consideration for all relevant commitments made by the Proponent throughout the Nunavut Impact Review Board’s review of the Project.”

The 2018 Annual Report (2018 Report) states that:

“Agnico submitted the TEMP Version 5 in June 2018. This new version includes final revisions following hearings and receipt of NIRB Whale Tail Project Certificate no. 008. Agnico is submitting via the 2018 Annual Report an updated TEMP Version 6, December 2018 (Appendix 51) to fully comply with the Project Certificate and also to reflect discussions held at the TAG meeting.” (AEM 2019, section 8.18)

The GN does not share the Proponent’s view that the latest version of the TEMP is fully compliant with Term and Condition No. 28 of the NIRB Whale Tail Project Certificate no. 008. Since issuance of this certificate, in March 2018, the TEMP has been revised twice (versions 5 and 6). Despite this, the latest version (version 6) does not reflect numerous commitments for revisions during review of the Whale Tail Project; some of which were scheduled to occur within 1 year of project certification. These commitments are summarized in Table 1 attached to this submission.

Since issuance of the certificate, the GN has worked with the Proponent via the Terrestrial Advisory Group and has requested that the Proponent incorporate relevant revisions to the TEMP to reflect commitments made during the final Whale Tail Pit Project final hearing. It is the GN’s view that there has been ample time to incorporate these commitments in a revised TEMP. At the present time, the GN is uncertain whether, how and/or when these commitments will be fulfilled.

**Recommendation 8:** The GN offers the following recommendations to the Board with respect to this issue:

- 1) The Proponent should provide a revised version of the TEMP that reflects all commitments (#1 through 37) made during the NIRB review of the Whale Tail Pit Project, as presented in Appendix B of the final hearing report (NIRB 2017).
- 2) To accompany this revised TEMP, the Proponent should provide a conformity table referencing the sections of the TEMP that address each commitment.



3) The 2019 Annual Report should provide information to demonstrate how commitments made during the NIRB review of the Whale Tail Project have been implemented.

**Agnico Eagle's Response:**

*An update TEMP Version 7 was submitted to NIRB on July 2, 2019 and included all of the commitments made during the NIRB review of the Whale Tail Project.*

*The 2019 Annual Report will report on the commitment implementation.*

### **1.9 Height-of-Land Surveys along the Whale Tail Haul Road**

**Term and Condition:** No 28 (Project Certificate 008)

**References:** Appendix 45 (Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report), section 7.2 – Objectives, section 7.3 – Duration; table 7.1 – Height-of-Land Survey Data Along the Whale Tail Haul Road in 2018, table 3.12 - Accuracy of Impact Predictions – Sensory Disturbance and Mortality along the AWAR, Vault Haul Road, and Whale Tail Haul Road; Nunavut Impact Review Board (NIRB). (2017). Final Hearing Report. Agnico Eagle Mines Ltd. Whale Tail Pit Project. NIRB File No. 16MN056; Terrestrial Ecosystem Management Plan (TEMP), version 6

**Concern:** With respect to the Whale Tail Pit project, the objective of Height-of-land (HOL) surveys is to provide an early warning system for detecting the presence of caribou in proximity to the Whale Tail Pit and Haul Road. This surveillance system provides a trigger for implementing mitigation measures including road closures during caribou migratory seasons.

In 2018, HOL survey effort, as reported in the 2018 Annual Report (2018 Report), was below minimums specified in the Project's Terrestrial Ecosystem Management Plan (TEMP). The GN has previously expressed concerns that even these minimums are too low and the Proponent had committed to increase HOL survey effort. To date, the Proponent has not fulfilled this commitment. The finding that HOL survey effort in 2018 was below these already low minimums is a significant concern.

The GN is of the view that HOL surveys as implemented in 2018 and specified in the TEMP do not provide an effective early warning system for implementing caribou protection measures. The 2018 Report's conclusion that disturbance of migrating caribou exceeded the monitoring threshold may be explained in part by the low level of HOL survey effort combined with low levels of road survey effort in 2018 (the other key mechanism for detecting caribou near the Project).

The GN is concerned that the Proponent is non-compliant with term and condition 28 (NIRB Project Certificate 008) because HOL survey effort in 2018 was below minimums specified in the



TEMP and the TEMP has not been revised to increase HOL effort, in accordance with commitments made during NIRBs review of the Whale Tail Project.

As part of the Caribou Protection Measures in the Project's TEMP, HOL surveys are conducted along the Haul Road to:

"[P]rovide an 'early warning' system of the presence of Caribou in proximity to the Whale Tail Pit and Haul Road." (AEM 2019, appendix 45, section 7.2)

These surveys are scheduled to:

"[B]e conducted once per week from January to April and from July to August. From May to June and September to December, the prime migratory period for Caribou, the frequency of surveys will increase to twice per week unless triggers (see Section 9) require surveys every two days." (AEM 2019, appendix 45, section 7.3)

In 2018, 15 HOL surveys totaling only 300 minutes of observation were conducted from September to December (AEM 2019, appendix 45, table 7.1). The GN is concerned about this reported survey effort for the following reasons:

- As an 'early warning' system to trigger measures designed to reduce disturbance of migrating caribou (e.g. road closures), 300 minutes of HOL surveys over a period of 12 months is inadequate by any reasonable standard. This represents 0.05% of the time that caribou could have interacted with the Haul Road in 2018; meaning that for 99.95% of the year there was no 'early warning' system in place.
- The level of HOL survey effort in 2018 was well below the minimums specified in the TEMP. Based on the minimum frequency of survey effort specified in the TEMP, at least 80 HOL surveys should have been conducted in 2018 (TEMP version 6, section 3.5.2.6 and table 14). For the period September to December, when 14 of the 15 HOL surveys were conducted, at least 32 surveys should have been conducted. Overall, HOL survey effort in 2018 was less than 20% of the minimum that should have been conducted if the TEMP was being fully implemented. This does not account for a further increase in survey efforts that should have been triggered when caribou were observed near the Haul Road.
- No HOL surveys were conducted during the spring migration (April-May) which is identified in the TEMP as a sensitive season for caribou when monitoring levels are supposed to increase along the Haul Road. This means that no 'early warning' system was in place during this sensitive season. As only a single road survey occurred in the spring the detection of caribou during the spring migration of 2018 relied on incidental





observations by Haul Road users. The GN finds this the lack of dedicated surveillance for caribou unacceptable.

- Caribou observations and subsequent closures of the Haul Road occurred in 2018 (AEM 2019, appendix 45, table 3.9) but it appears from the 2018 Report that the frequency of HOL survey effort did not increase concurrently to every 2 days, as specified in the TEMP (TEMP version 6, section 3.5.2.6 and table 14).
- HOL surveys are supposed to occur during all phases of the Project that have potential to interact with caribou including construction and operations phases. 2018 was a construction year for the Whale Tail Project.
- The GN has repeatedly expressed concern that the minimum frequency of HOL surveys, as specified in the TEMP (versions 5 and 6), is too low and will not provide the 'early warning' system needed to protect caribou from adverse impacts of the Haul Road. The fact that survey effort in 2018 was below the levels specified in the TEMP, levels the GN already considers too low, is of great concern. Neither the TEMP in its current form nor the survey effort implemented in 2018 reflects the commitment to increase survey effort made by the Proponent during the NIRB's review of the Whale Tail Pit project.
- Given the low levels of HOL surveying and road surveying in 2018, including a near total lack of reported surveying during the spring migration, it appears that implementation of the Project's caribou protection measures was highly dependent on incidental observations of caribou made by people using the Haul Road. These observations are short range in nature resulting in a decrease in their effectiveness in use as a preventative measure for disturbance. . This lack of surveillance may have contributed to the observed deflection of caribou from the road in 2018, as reported in the 2018 Report (AEM 2019, appendix 45, table 3.12).

Overall, the GN finds that survey effort to support caribou protection measures was unacceptably low in 2018; below the minimums specified in the TEMP for each type of survey. Further the minimums specified in the TEMP are themselves too low and have not been increased in accordance with commitments made the Proponent during the NIRB's review of the Whale Tail Pit project. The GN is of the view that the Proponent is accordingly non-compliant with term and condition 28 (NIRB Project Certificate 008).

**Recommendation 9:** The GN offers the following recommendations to the Board with respect to this issue:

1. That the Proponent should explain why the number of HOL Surveys conducted in 2018 was less than 20% of the minimum number specified in the Project's TEMP.



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**Agnico Eagle's Response:**

*Please refer to Agnico's response to GN's recommendation 3 above regarding the low number of road surveys, especially in April and May 2018. Since HOL surveys are generally conducted during road surveys, the overall number of HOL surveys was also affected by the reduced number of road surveys. Other factors that contributed to the low frequency of HOL surveys included, personnel issues, safety (i.e., two field staff were not always available to walk to the HOL stations), and weather.*

2. That the Proponent should explain why HOL surveys were not conducted during the spring caribou migration.

**Agnico Eagle's Response:**

*Please refer to Agnico's response to GN's recommendation 3 above regarding the frequency of road surveys during the spring Caribou migration. HOL surveys were conducted more frequently in spring 2019.*

3. That the Proponent should explain why the frequency of HOL surveys was not increased to every 2 days in 2018 in response to observations of caribou and subsequent Haul Road closures.

**Agnico Eagle's Response:**

*Please refer to Agnico's response to GN's recommendation 9-1 above.*

4. The Proponent should provide a revised version of the TEMP that reflects the commitment made during the NIRB's review of the Whale Tail Pit project to increase the frequency of HOL surveys (NIRB 2017, Appendix B).

**Agnico Eagle's Response:**

*An update TEMP Version 7 was submitted to NIRB on July 2, 2019 and included all of the commitments made during the NIRB review of the Whale Tail Project.*

5. The 2019 Annual Report should provide information to demonstrate how the commitment to increase HOL survey frequency has been implemented and how this method of survey is providing an effective 'early warning' system to detect caribou approaching the Haul Road.

**Agnico Eagle's Response:**

*Agnico acknowledges GN's recommendation and will include the requested information in the 2019 Annual Report.*

### **1.10 Road Mitigation for Caribou**

**Term and Condition:** No 28, 30 (Project Certificate 008)



## AGNICO EAGLE

**References:** Appendix 45 (Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report), Section 3.6.5 - Road-related Mitigation, section 6.6 – Results, section 6.7 – Caribou Migration Patterns, section 8.18.1.4 Caribou Collaring Study Meadowbank, Appendix A - 2018 Road Survey Forms – Meadowbank AWAR and Vault Haul Road, Appendix B - 2018 Road Survey Forms – Whale Tail Haul Road, Appendix E – 2018 Wildlife Observations; Terrestrial Ecosystem Management Plan (TEMP), version 6

**Concern:** The 2018 Annual Report (2018 Report) contains several inconsistencies in the reporting of road closures for caribou and lacks clarity with respect to how reported road restrictions were implemented in-order to reduced disturbance of caribou. Of greatest concern to the GN is the apparent failure to close Project roads on numerous occasions in 2018 when groups of caribou were observed. It appears that the caribou protection measures specified in the Project's Terrestrial Ecosystem Management Plan (TEMP), in the form of decision trees, are not being fully or consistently implemented. If this is the case, this would accordingly mean the Proponent is non-compliant with Terms and Conditions Nos. 28 and 30 (Project Certificate 008).

The 2018 Report provides information on the management of Project roads in response to the presence of caribou, including road closures to allow caribou to cross. The GN notes several areas where clarifications and/or additional information regarding road management are needed in-order for reviewers to determine whether the Project's caribou protection measures are being implemented properly. The GN is also concerned that the closure of roads in 2018 may not, in several instances, have been managed in accordance with the caribou protection measures specified in the Project's TEMP.

### Road Closures for Caribou in 2018

The 2018 Report provides a summary of road-related mitigation in response to observations of caribou in 2018. This includes tables summarizing road closures and traffic restrictions along the All-Weather Access Road (AWAR), Vault Haul Road, and Haul Road (AEM 2019, appendix 45, table 3.7, 3.8, 3.9 respectively). The GN notes several inconsistencies between these tables and other parts of the 2018 Report, as follows:

- Information in table 3.7 does not match that appearing in table 4.1 which lists wildlife observations made in 2018 that required action. For example, table 4.1 indicates that the AWAR was closed August 12, 13 and 21. These closures are not listed in table 3.7. The 2018 Report does not explain this inconsistency.
- Review of the 2018 Report's appendices shows that there were numerous days during the spring and fall caribou migrations when caribou, in groups greater than the Group Size Thresholds (GST) specified in the TEMP and under Term and Condition No. 30 (NIRB



Project Certificate 008), were observed within 1.5 km of the AWAR or Haul Road; typically within a range of 500m. Examples of days when these observations were recorded are listed in table 1 below. In accordance with the caribou protection measures specified in the TEMP, these observations should have triggered a road closure to non-essential vehicles (TEMP version 6, Figures 7 and 8). However, these closures are not reported in tables 3.7 to 3.9, table 4.1 or in other parts of the 2018 Report. It is unclear why road closures were not implemented on these days. The GN is concerned that the Project's caribou protection measures are not being properly implemented.

Table 1. Days in 2018 when caribou, in groups exceeding GSTs, were observed near Project roads but road closures were not implemented.

Source	Days Observation Made	Road
Appendix A (AEM 2019)	April 4, 24. May 8, 11, 18, 25. Sept 25, 28. Oct 1. Nov 15	AWAR
Appendix B (AEM 2019)	April 19. Oct 17, 24, 25.	Haul Road
Appendix E (AEM 2019)	April 2, 7, 8, 9, 10, 24, 25. May 24. Oct 22, 28, 31. Nov 8, 9, 15, 16	AWAR
Appendix E (AEM 2019)	Sept 22, 26, 27	Haul Road

For the Whale Tail Pit Haul Road, road restrictions related to ungulate activity caribou are summarized in table 3.9 (AEM 2019, appendix 45). The table provides that traffic was “restricted” on difference occasions but does not define what the term “restricted” means. Additionally, there is no additional information regarding decisions to allow partial travel or partial activity when the Haul Road was otherwise closed. This lack of information hinders reviewers’ ability to meaningfully analyze the effectiveness of all road mitigation measure.

The 2018 Report indicates that during the period September 16 to October 14:

“Some of the Lorillard and Wager Bay animals that did not cross the Meadowbank Road during late summer crossed successfully during the fall season, particularly those animals north of Whitehills Lake (see Figures 6.2, 6.5 and 6.8). Others, primarily along the Whale Tail Haul Road north of the Vault and south of Whitehills Lake appeared to move away



from the road in a northeastern direction, remaining east of the road during the fall rut (see Figures 6.2 and 6.8). Mine records indicate that small to moderate groups of Caribou were seen within the mine LSAs during the fall period (see Table 4.2 and Appendix E). Only one road closure on 27 September along the Meadowbank AWAR was required during this period (see Table 3.4 and Table 4.1).” (AEM 2019, appendix 45, section 6.6)

With respect to this statement the GN notes the following:

- Contrary to suggestions in the 2018 Report, the Meadowbank AWAR road closure on September 27 does not appear to be a response to the observation of caribou near the road; a response specified in the Project’s TEMP. Neither Appendix E nor table 4.2 of the 2018 Report lists any caribou observations along the AWAR from September 22 to 30. It appears the timing and duration of this road closure was not based on caribou monitoring information.
- As noted above, in table 1 of this GN comment, observations of caribou above the GSTs were made on several days in September and October. These should have triggered closure of the AWAR but according to the 2018 Report did not.
- The GN provided maps of the locations of collared caribou to the Proponent on a daily basis during spring and fall migration periods. As is discussed in the 2018 Report and also evident from these maps, the September 27 road closure occurred after the bulk of collared animals had been deflected several times in their attempts to cross the road. The GN is concerned that this one-day road closure occurred too late, after adverse effects on migrating caribou, spanning a period of several weeks, had already occurred. It is unclear why the AWAR was not closed earlier and for longer during the fall migration in response to the collar information provided to road managers and the ground-based observations of Project personnel. The Project’s caribou protection measures are meant to be applied proactively to prevent adverse effects rather than being applied after these effects have occurred.

#### Deflection of Caribou and Available Collar Data

The 2018 Report acknowledges that a significant deflection of caribou from Project roads occurred in 2018, stating that:

“Collared animals are observed throughout the RSA (typically around spring and fall migratory periods). A pattern of animals being deflected from the AWAR is evident based on an analysis of data from 2011 to 2018 (Figures 6.7 and 6.8).” (AEM 2019, appendix 45, section 6.7)



With respect to the report's findings the GN notes that inspection of figures 6.7 and 6.8 suggests that caribou were also deflected by the Haul Road during their spring migration in 2018. The GN is concerned that once more collared animals are observed interacting with the Haul Road and once haul truck traffic begins to use the Haul Road, this observed pattern of deflection will worsen.

As required under Term and Condition No. 57 (NIRB Project Certificate 004) and Term and Condition No. 29 (NIRB Project Certificate 008), the Proponent participates in a caribou collaring program in collaboration with the GN. The 2018 Report states that:

"The satellite-collaring program was developed to provide information on the distribution of Caribou occurring within the Meadowbank RSA and contribute data to ongoing satellite-collaring programs for the Ahiak, Qamanirjuaq, and other herds. The satellite-collaring program, along with GN DoE regional data, is an important monitoring and management tool that provides a regional perspective on Caribou activity near mine operations. Another key objective of the program is to provide timely information for the Caribou management and monitoring strategy at the Meadowbank and Whale Tail sites (i.e., Decision Tree approach; see 2018 TEMP)." (AEM 2019, section 8.18.1.4)

The 2018 Report does not indicate what investment was made by the Proponent in 2018 to deploy collars on caribou that are likely to interact with the Haul Road. It is thus unclear how the Proponent has attempted to fulfill the collaring program's objective of obtaining timely information to support implementation of the 'Decision Tree Approach'; an approach that requires near real-time information on the locations of caribou in-order to manage Project roads on a daily basis.

**Recommendation 10:** The GN offers the following recommendations to the Board with respect to this issue:

1. That the Proponent should clarify the inconsistencies between tables 3.7 and 4.1 in the Annual Report with respect to road closures for caribou.

**Agnico Eagle's Response:**

*The data represented in Table 3.7 (and Tables 3.8 and 3.9) and Table 4.1 originate from two different sources. Table 3.7 summarizes information contained in 'Wildlife Mitigation Documentation' (i.e., Road Status Updates) provided in Appendix C, while Table 4.1 summarizes information from the more general 'Wildlife Observation Records' (see Appendix E), which focus on observations within the mine sites. Inconsistencies between these two data sources will be corrected in the 2019 report.*



2. That the Proponent should explain why road closures were not implemented in response to observations of caribou made on the days listed in table 1 (above).

**Agnico Eagle's Response:**

*Collection of data linking monitoring results with mitigation actions (e.g., road closures) was not adequate in 2018 but has been approved in 2019. For the 2019 report, a clearer link will be described.*

3. With respect to the reported closure of the AWAR on September 27, 2018, the Proponent should explain what information from caribou monitoring, on or around September 27, prompted the road closure. The Proponent should clarify where this information can be found in the 2018 Report. The Proponent should advise what monitoring information formed the basis for reopening the road after September 27.

**Agnico Eagle's Response:**

*Closure of the road on September 27 likely resulted from information provided by road maintenance, operations, or Environment staff rather than from a dedicated survey. In the future, more information behind decisions to close roads or restrict traffic will be provided.*

4. That the Proponent should explain why the AWAR was not closed earlier during fall migration in response to collar maps provided to road managers.

**Agnico Eagle's Response:**

*It's part of Agnico's management to increase the field road surveillance when the collars maps received indicated that the caribou are approaching. The collars maps are not the only tool use to trigger the closure or not of the road.*

5. That the Proponent should outline what specific efforts and investment it made in 2018 to collect data on the movements of collared animals in proximity to the Haul Road in-order to support day-to-day road management and monitor Project effects.

**Agnico Eagle's Response:**

*As collared animals entered the study area and approached mine facilities, requests are made to the GN/Caslys Consulting to increase the frequency at which collar location maps were provided. Examples include: a) April 16, 2018 – request for collar maps to 2x/week; b) September 4, 2018 – request for collar maps to 2x/week; and c) April 01, 2019 – request for daily collar maps.*

6. That the Proponent should retain the services of a consultant to conduct an independent audit of the implementation of caribou protection measures for the Project. This audit should assess



how the caribou decision trees within the TEMP are being implemented in each case when caribou are observed near the Project in 2019. Results of this audit should be appended to the 2019 Annual Report.

**Agnico Eagle's Response:**

*Agnico acknowledges GN's recommendation and will evaluate it further.*

7. The Proponent should ensure that the caribou decision trees specified in the TEMP (TEMP version 6, figures 7 and 8) will be implemented in a consistent manner on every occasion caribou are observed.

**Agnico Eagle's Response:**

*Agnico will ensure that the decision trees in version 6 of the TEMP will be implemented in a consistent manner.*

The GN seeks the following clarifications with respect to Table 3.9 of the 2018 Report:

- For April 22, please explain what is meant by “restricted”. Does this mean the amount of traffic using this portion of the road was decreased? If so, how. If not, what restrictions were implemented. How does escorting of traffic reduce disturbance of caribou?

**Agnico Eagle's Response:**

*Under ‘restricted’ access, only obligatory small vehicles or light trucks are permitted to use the road. Tankers or other heavy equipment for hauling, construction or maintenance are not allowed. This means that the amount of traffic using this portion of the road was significantly decreased.*

*When delivery of goods or to allow crew change are necessary, escorts are led by a member of the Environment Department, in collaboration with the Baker Lake HTO and/or KIA, who is adequately trained (i.e., able to assess Caribou behaviour, movements, etc.) and has the authority to stop the convoy, if necessary. For example, a convoy travelling from Baker Lake to Meadowbank in spring 2019 stopped for several hours to allow a group of Caribou to cross the road. In addition, convoys limit disturbance to a single event rather than multiple events over a longer period of time.*

- For April 27, 28 and May 14, 15, 27, please explain what is meant by “restricted” in each of these cases.

**Agnico Eagle's Response:**

*Please refer to Agnico's response above.*





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- For May 4 the table indicates that the Haul Road was “Closed to all traffic; construction work allowed to continue between Vault Laydown and km 20”. Please explain what caribou monitoring (i.e. height-of-land surveys, road surveys etc) was being conducted on May 4 that supported the decision to continue construction. What information was obtained from this monitoring that led to the decision to continue construction? Where in the Annual Report is this monitoring information reported?

**Agnico Eagle’s Response:**

*The Environment Department, even if no official wildlife survey sheets were recorded, monitored the caribou migration along the WTHR on a daily basis during caribou migration. Recording all road monitoring was improved in 2019. On the notification sent to HTO, KIA and GN on May 4, Agnico mentioned: ‘Vault transit to KM20 is restricted to light vehicle only for the construction crew as no caribou were observed on that section of the road this morning’. It was determine that there is no risk to allow the construction between Vault laydown and Km 20. KIA was also on site on May 4 to provided assistance to the Environment Department with the monitoring of the road and no concerns were raised.*

- For May 8 and 11, please explain whether the closures on these days are reported as caribou-related, or were the result of weather closures.

**Agnico Eagle’s Response:**

*Road closures during the May 8<sup>th</sup> to 11<sup>th</sup> period were due to a number of factors, including snow accumulation, Caribou close to the road, and Muskox close to the road at Km 95 (see Appendix C of the 2018 Wildlife Report).*

- For May 22 why was the road only closed for northbound traffic? What is different about southbound traffic that made it acceptable to continue while caribou were crossing the road?

**Agnico Eagle’s Response:**

*The road was initially closed to northbound traffic leaving the Vault because Caribou were observed at the beginning of the Amaruq Road (note: southbound traffic would require some time to reach the Vault end of the road). Further evaluation determined that Caribou had moved away from the road later in the day allowing the road to be reopened to all traffic.*



## 2 Fisheries and Oceans Canada (DFO)

### 2.1 Design Report and Construction Drawings

**Term and Condition:** Fisheries Act Authorization 16-HCAA-00370 Condition 2.3.5 and 2.4.1 and NIRB Project Certificate No. 008 Condition 21

**References:** 2018 Annual Report Section 3.5.2.1 (p. 48)

**Concern:** Under this section the proponent references Fisheries Act Authorization 16-HCAA-00370 Condition 2.3.5 and 2.4.1 and NIRB Project Certificate No. 008 Condition 21, stating: “As-built reports for culvert construction, including photographs, will be provided to NWB 90 days after the construction completion, as required according to the Project’s Type A Water License (2AM-WTP1826) Part D Item 15. DFO will have the opportunity to comment on all design reports submitted to the NWB for approval. Agnico will continue to construct infrastructures in such a manner that it does not unduly prevent or limit the movement of water or fish species in fish streams and rivers.”

**Recommendation 1:** DFO-FFHPP acknowledges Agnico’s commitment to submitting detailed as-built design reports. DFO-FFHPP will review those reports to determine whether potential impacts to fish passage have been mitigated and avoided. DFO-FFHPP has no further comments at this time

**Agnico Eagle’s Response:**

*Agnico acknowledges DFO’s comment.*

### 2.2 Whale Tail Site

**Term and Condition:** Fisheries Act Authorization 16-HCAA-00370 Condition 2.3.3 and NIRB Project Certificate No.008, Condition 22

**References:** 2018 Annual Report Section 8.6.2 (p. 182)

**Concern:** Under this section the proponent references Fisheries Act Authorization 16-HCAA-00370 Condition 2.3.3 and NIRB Project Certificate No.008, Condition 22 stating: “In 2018, 45 blasts were monitored at Whale Tail. There were two (2) PPV concentrations that exceeded the DFO limit of 13 mm/s....The two exceedances were recorded in 2018 and occurred during period of egg incubation (egg incubation period is from August 15 to June 30).” With regards to preventing exceedances, Agnico states explosives quantity and blast delays were implemented (with reference to the Blast Monitoring Plan). In addition Agnico states two exceedances were recorded on a Whale Tail Haul Road quarry, though investigation indicated improper instrument



installation was the cause (i.e. placement next to the blast and not next to the closest fish bearing waterbody for both of the events). Agnico states: “Going forward, it will be imperative to develop a proper blast monitoring plan for every blasting activity outside of the areas covered in the current blast monitoring plan (for Portage, Vault and Whale Tail Pit).”

DFO-FFHPP notes the egg incubation period during which exceedances occurred, and acknowledges that mitigation measures were implemented to prevent future exceedances at Whale Tail Station #1. DFO-FFHPP also notes that Agnico indicates that after reduction of explosives quantity, no exceedances were observed for preshear holes. Regarding improper installation of instrumentation, DFO agrees that “it will be imperative to develop a proper blast monitoring plan for every blasting activity outside of the areas covered in the current blast monitoring plan (for Portage, Vault and Whale Tail Pit)”. DFO-FFHPP further notes that exceedances of blasting thresholds (PPV and Peak Pressure) have the potential to cause serious harm to fish, particularly during incubation.

**Recommendation 2:** DFO-FFHPP reminds Agnico that adherence to blasting thresholds are required for all blasting activities near, or in fish bearing waterbodies and watercourses. Blasting activities that occur outside of areas covered in a blast monitoring plan, are still required to adhere to blasting thresholds. As such, DFO-FFHPP should be notified when exceedances have occurred.

**Agnico Eagle’s Response:**

*Agnico acknowledges DFO’s comment and will notify DFO when exceedances occurred, during the egg incubation from August 15 to June 30, outside areas covered in the Blast Monitoring Plan.*

### **2.3 Fishout Program Summary**

**References:** 2018 Annual Report Section 8.11 Fishout Program Summary, 8.11.2 Whale Tail Site (p. 202)

**Concern:** In this section it states: “Overall, the objectives of the Whale Tail Lake fishout were met:

- the local community was engaged;
- a large proportion of the fish in the area to be dewatered were either rescued and released or fully utilized by traditional resource users; and
- ecological information (biological, limnological, and habitat) was collected to contribute to our understanding of productivity in Arctic lakes in the Northwest Territories and Nunavut.”



DFO- FFHPP notes that Agnico has conducted its Whale Tail Lake fishout program. However, DFO- FFHPP notes concerns were raised respecting the completion of fishout and sufficiency of fish out target end-point being met.

**Recommendation 3:** DFO-FFHPP will be engaging Agnico with regards to fulfillment of obligations and the validity of their conclusions.

**Agnico Eagle's Response:**

*Agnico will wait on DFO engagement regarding the fulfillment of obligations and validity of conclusion of the Whale Tail Fishout Program.*

## **2.4 Wildlife Monitoring on Vessel**

**References:** 2018 Annual Report Section 11.8.2 Wildlife Monitoring on Vessel (p. 297)

**Concern:** DFO-FFHPP notes that Agnico states that no marine mammal sightings or mammal – vessel interactions were recorded in 2018. DFO-FFHPP acknowledges that Appendix 51 provides the Marine Mammal Management and Monitoring Plan and that Appendix 55 provides the Marine Mammal and Seabird Observer (MMSO) Report for the 2018 shipping season. DFO-FFHPP also notes that in the 2018 MMSO Report under section 3.1.2 it states : “Dedicated marine mammal observer effort included 29 hours and 1,155.7 km in 2018 onboard the Acadia Desgagnés. An additional 153 hours of incidental marine mammal observations were collected onboard the Dara Desgagnés (see Table A-3, Appendix A). Spatial effort could not be calculated for the incidental effort because start and end coordinates were not recorded.”

DFO-FFHPP notes that lack of marine mammal observations may have resulted from issues with survey protocols, implementations of protocols, and/or training of observers. DFO-FFHPP echoes comments provided by ECCC regarding adequacy of training and adherence to survey protocols.

**Recommendation 4:** DFO-FFHPP suggests that opportunity to discuss the protocols, implementation of protocols and adequacy of training could be beneficial to interested parties and the success of the marine mammal monitoring program overall.

**Agnico Eagle's Response:**

*Desgagnés Group, the contractor responsible of fuel and goods delivery at Baker Lake, has been collaborating on the voluntary whale watching data collection project of the Marine Mammal Observation Network (MMON) since 2015. Each year, training is given by MMON to ship officers to train them in marine mammal identification and observation. Desgagnés, in collaboration with MMON, also developed a Poster and a manual with supporting documents for marine mammal identification. Those tools are available on*



*each ships to increase the effectiveness of the marine mammal survey. A Quiz, still developed in collaboration with MMON, was also used to test the knowledge of ship officers.*

*In addition, Agnico Eagle has reached out to DFO regarding training opportunities. DFO is to provide a response back early July. Agnico Eagle is also available to discuss survey protocols at the convenience of DFO.*

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

#### **3.1 Resolution of Issues Identified during 2017 Annual Report Review**

**References:** 2018 Annual Report, Appendix 1, Table 1.3 and Appendix 17

##### **3.1.1 Lake Level Monitoring - Turn Lake**

**Concern:** Turn Lake water levels are not being monitored. As per Section 4.2.1, AEM indicated Turn Lake water level monitoring will be initiated during the 2019 open water season and the results will be reported and compared to predictions in the next annual report.

**Recommendation 1.1:** CIRNAC looks forward to reviewing the 2019 Annual Report to confirm changes in Turn Lake water levels

##### **Agnico Eagle's Response:**

*Agnico will provide Turn Lake water level monitoring in the 2019 Annual Report.*

##### **3.1.2 Tailings Freezeback and Capping Thickness**

**Concern:** CIRNAC recommended that AEM include a meaningful discussion of the results from the permafrost monitoring in the Annual Report. FEIS predictions should be compared with monitoring results and be clearly presented. AEM should present the updated modeling supporting their conclusions that the conceptual plans for thermal encapsulation of the Tailing Storage Facility and the Waste Rock Storage Facility remain effective to prevent and control deleterious seepage over long term. Finally, if results show discrepancies from the predicted values, AEM should discuss the management actions that should be implemented to address the risk.

AEM notes the following in Section 7-2 of the Waste Rock and Tailings Management Plan (Appendix 17 of the 2018 Annual Report): "Mandate with consultant ongoing - more details to be provide in future annual report".



**Recommendation 1.2:** CIRNAC re-iterates the importance of implementing the abovementioned recommendations and looks forward to reviewing the requested information in the 2019 Annual Report.

**Agnico Eagle's Response:**

*As mentioned in Section 8.2 of the Waste Rock and Tailings Management Plan the capping of the both Cell of the Tailings Storage Facility (TSF) are currently active with ongoing tailings deposition. The current thermistors installed in the TSF allow the gathering of data on the thermal regime of the tailings during operation. Progressive capping is ongoing, but its surface area is limited and there are few thermistor installed within the capping. As a result, limited data is available on the tailings thermal regime when capped. A capping study will be undertaken to implement the CIRNAC recommendation at closure once more instruments will have been installed in the TSF capping. In the 2019 annual report a meaningful discussion on the thermal data during operation will be included and compared to the conceptual thermal modelling results.*

*As mentioned in Section 8.3 of the Waste Rock and Tailings Management Plan a study is ongoing with a consultant to calibrate the thermal model and develop an instrumentation plan to assess the cover performance of the Whale Tail WRSF. This mandate is soon over and Agnico will initiate in 2019 a similar approach at the Meadowbank RSF to review the available data, compare thermal results to FEIS prediction, identify data gap and propose new instruments location for closure. This mandate is expecting to be recurrent over the year with the ultimate objective of updating the modelling supporting the conclusion that the cover design is effective to comply with the water quality objective of the project at closure. Initial data from this study should be available to be presented in the 2019 annual report.*

### **3.1.3 Tailings Freezeback and Capping Thickness - Research**

**Concern:** CIRNAC recommended AEM provide more information on the nature and extent of research efforts, results of the research and a discussion of how the proposed cover design has been influenced by these results. In Section 5.4.1 of the 2018 Annual Report, AEM indicates that in 2018, the Research Institute in Mine and Environment (RIME) continued to collect and analyze data on the cover field trial and on the long-term performance of ultramafic rockfill as a cover material. Studies are ongoing and no additional data are available to be shared at the moment. Publications are expected in 2019.



**Recommendation 1.3:** CIRNAC re-iterates the importance of implementing the abovementioned recommendations and looks forward to reviewing results of the cover trials in the 2019 Annual Report.

**Agnico Eagle's Response:**

*Study with the RIME is ongoing and publications are expected to be available in 2019. The 2019 annual report will provide reference to literature published by the RIME on this subject in 2019 (if any). Agnico will also comment in the 2019 annual report how these results will influence the cover design of the TSF and RSF.*

### **3.1.4 Progressive Reclamation – Mine Site**

**Concern:** CIRNAC recommended that 2018 updates to Interim Closure and Reclamation Plan (ICRP) include more details on progressive reclamation such as: areas of Tailings Storage Facility (TSF) and Waste Rock Storage Facility (WRSF) facilities covered in 2017 and total areas to date, along with the volumes associate with these areas, amongst others.

In the 2018 Annual Report, AEM noted that the 2018 ICRP update was submitted to NWB on August 22, 2018. Following the authorities' review period of this plan, no comments were received regarding the current CIRNAC's recommendation. In the 2018 updated version, information regarding the progressive closure of TSF and WRSF can be found in Section 6.2 of the report, however it does not include all the details requested by CIRNAC. Agnico may consider adding some of this information in the next ICRP revision. The annual report will continue to include detailed progressive closure completed during the year.

**Recommendation 1.4:** CIRNAC recommends that the next ICRP revision, including updates requested by CIRNAC, be presented in the 2019 Annual Report.

**Agnico Eagle's Response:**

*Agnico acknowledges CIRNAC's comment and may consider adding some of this information in the next ICRP update. However, this updated version including additional information on progressive closure may not be provide via the 2019 Annual Report.*

*In a mean time, future annual report will continue to include detailed progressive closure completed during the year.*

### **3.1.5 Inspections, Compliance Reports and Non-Compliance Issues**

**Concern:** CIRNAC recommended that AEM provide a summary statement on findings of all inspections and if and where necessary, provide a list of issues that have been identified and the



status of these issues. AEM in Section 11.5 of the 2018 Annual Report provided summary statements on findings for some (e.g. TC, ECCC, CIRNAC), but not all, of the inspections that occurred during the year, notably no comment on NIRB inspection findings.

**Recommendation 1.5:** CIRNAC recommends that in addition to providing the list of items discussed as per Section 11.5.1.4 of the 2018 Annual Report, AEM should provide high level statements as to whether or not there are any issues associated with each of the areas of discussion.

**Agnico Eagle's Response:**

*It is Agnico's intent to continue to refer directly to the NIRB Monitoring Report to capture the whole essence of the interpretation of the report. Also, the NIRB letter: '2017-18 Annual Monitoring Report for the Meadowbank Gold Project and the Whale Tail Pit Project with Board's Recommendations', received each year, already include a summary of the findings that resulted from monitoring of the mine. Agnico provided in Appendix 54 of the 2018 Annual Report the responses to the NIRB recommendations.*

*Agnico has improved Section 11.5 Inspection and Compliances Report in the 2018 Annual Report. It is also Agnico's belief that a summary of the inspections completed in the year is already provided. However, Agnico will continue to improve information reported in this section in future annual reports, if it's possible to extract the information from the report without removing the context of the findings.*

### **3.1.6 Post-Environmental Assessment Monitoring Program (PEAMP)**

**Concern:** Evaluation of Impact Predictions - CIRNAC recommended that AEM include a temporal analysis identifying trends over time in the data interpretation.

In its response to this comment, AEM indicated the following: "It is Agnico's belief that a comprehensive update is not warranted as part as the PEAMP. According to the proponent's responsibilities identified under Appendix D of the Project Certificate, examinations are provided as required in individual monitoring reports. As such, trending analyses would also not be required under the aforementioned responsibilities. Agnico is confident that these discussions reference any potential impacts observed. In addition, the annual report is based on an extensive review of the FEIS throughout its content.

Nonetheless, Agnico, is committed on improving identification of noted effects within the PEAMP summary report in this section and intends to highlight any trends observed for VEC's exceeding predictions with the 2018 Annual report and moving forward." AEM's interpretation of Appendix





D of the Project Certificate is to discuss trends only when impacts are observed, and thus AEM believes that the condition is being met and further interpretation is not necessary.

**Recommendation 1.6:** CIRNAC recommends that AEM include a temporal analysis identifying trends over time in the data interpretation.

**Agnico Eagle's Response:**

*Agnico will reiterate its position and is available to discuss the current concern with CIRNAC and NIRB at their convenience.*

*It is Agnico's belief that a comprehensive update is not warranted as part of the PEAMP. According to the proponent's responsibilities identified under Appendix D of the Project Certificate, examinations are provided as required in individual monitoring reports. As such, trending analyses would also not be required under the aforementioned responsibilities. Agnico is confident that these discussions reference any potential impacts observed.*

*In addition, the annual report is based on an extensive review of the FEIS throughout its content and individual monitoring report provided in appendix. Agnico's interpretation of impact, trending and comparison to FEIS are provided for, among other, water quality, level and quantity, wildlife, noise, air, socioeconomic.*

*Nonetheless, Agnico, is committed to improving identification of noted effects within the PEAMP summary report in this section and intends to highlight any trends observed for VEC's exceeding predictions with the 2019 Annual report and moving forward.*

### **3.1.7 Results of Thermistor Measurements for Tailings and Waste Rock Storage Facilities**

**Concern:** CIRNAC recommended that AEM analyze the thermistor monitoring results against early thermal modelling predictions and update its Waste Rock and Tailings Management Plans if large discrepancies are observed between the monitoring results and model predictions in the 2018 Annual Report.

AEM acknowledged CIRNAC's comment and indicated that this task has been assigned to the consultant and that the requested information will be provided in the 2019 Annual Report.

**Recommendation 1.7:** CIRNAC re-iterates the importance of implementing the abovementioned recommendations and looks forward to reviewing these results in the 2019 Annual Report.



**Agnico Eagle's Response:**

*Agnico will refer to answer to comment 3.1.2 above.*

### **3.2 Compliance Monitoring**

**References:** Section 8.3.1.3 & Section 8.3.2.1 of 2018 Annual Report

**Concern:** While the requirements of various monitoring programs such as those conducted under the Meadowbank Dike Review Board (MDMER) were generally met, occasional non-compliances were observed relating to avoidable missed opportunities for sampling or analysis resulting from what appears to be poor planning and tracking.

For example, as noted in Section 8.3.2.1 for the Whale Tail project, effluent discharge occurred from July 27 to August 10 and from August 14 to August 27, during the in-water portion of the Whale Tail Dike Construction, making the site subject to the MDMER. However, the effluent was not sampled for pH and deleterious substances when discharge was initiated on July 27 as well as the following week (July 29 to August 4). Similarly, toxicity sampling to assess acute lethality of the effluent to fish (three spine stickleback) was not conducted in July. Toxicity testing under the Environmental Effects Monitoring (EEM) program to assess sub-lethal toxicity of the effluent to fish, invertebrate, aquatic plant and algal species was also not conducted on the effluent. The reason for this was because the discharge stopped earlier than anticipated and prior to the scheduled test date, and an accredited laboratory was not available for the analysis at this earlier time. Radium-226 was not analyzed on the effluent sample from August 6 because the sample bottle was never sent to the laboratory for analysis.

Similarly, as noted in Section 8.3.1.3. for the Meadowbank site, pH was not measured on the East Dike discharge on May 14, due to an omission by the field technician while effluent was not sampled the week of December 2 to 8, due to plane delays on December 3, and issues with field execution the following day. Due to an error by the laboratory, acute lethality testing was not completed on the effluent sample collected on November 19, and because of ineffective communication between the laboratory and AEM, AEM was not aware that the analysis had not been completed.

**Recommendation 2:** CIRNAC recommends that AEM review its internal planning, communications protocols, and management plans and assess if improvements can be incorporated to existing procedures to ensure planning and timely execution of all sampling requirements.

**Agnico Eagle's Response:**

*Agnico has already conducted a review of its internal planning and communication protocols to ensure compliance in regards to MDMER and other water quality monitoring.*



*Agnico will continue to develop methods and tools that will promote the planning and the timely execution of sampling requirements.*

### **3.3 Tailings Storage Facility Capacity Limitations**

**References:** Section 5.3.1 of 2018 Annual Report

**Concern:** In Section 5.3.1 of the annual report, AEM indicates that the tailings deposition model was updated to comply with the new Life of Mine (LOM) and draws the following main conclusions from the modelling:

- The total estimated residual capacity of the Tailings Storage Facility (TSF) North Cell (structures at El.150masl and 154masl) and South Cell (structures at El.150m), based on tailings dry density is 9.6 Mt;
  - The total capacity of the North Cell is estimated at 3.8 Mt;
  - The total capacity of the South Cell is estimated at 5.8 Mt;
  - The LOM mill throughput is stated as 9.6 Mt, indicating there is sufficient capacity in the approved TSF.

Through review of the modelling it is concluded that the TSF provides sufficient capacity (9.6 Mt) to accommodate the expected mill throughput (9.6 Mt). CIRNAC notes that these two numbers match exactly and there doesn't appear to be any contingency built into these estimates. For instance, the available storage capacity in the TSF North and South cells is based on the assumption of a particular dry density for the tailings. However, changes in the dry density resulting from variations in ore characteristics (e.g. Whale Tail pit ore) and deposition methodology could affect the estimate of available storage capacity.

It is unclear as to what would happen in the event that more tailings storage is required prior to approval of In-Pit disposal.

**Recommendation 3:** CIRNAC requests that AEM provide a discussion of the implications of existing tailings capacity not being adequate to address current or future LOM throughput.

**Agnico Eagle's Response:**

*Agnico has received approval for the in-pit disposal project. As per the license condition, an updated Waste Rock and Tailings Management Plan including an updated tailings deposition plan will be submitted in July 2019 and will address this comment.*

### **3.4 Geotechnical Implementation and Inspections**

**References:** Section 3 of 2018 Annual Report, Appendix 7 and 11



**Concern:** Golder 2018 Geotechnical inspections continue to flag some areas of potential concern related to some site features both on the mine sites and at off-site locations such as the all-weather road and at the Baker Fuel facility. In particular, CIRNAC notes that Golder has recommended that “... consideration should be given to expand AEM’s monitoring program to include all culverts and bridges along the road in order to assess whether they are providing adequate capacity during the freshet and following large precipitation events”.

In the cases of bridges and culverts, these concerns have been raised before and AEM’s ongoing response to these concerns is that the bridges and culverts are being monitored on a regular basis as required. In other cases, concerns are new items and commitments have been made to assess and address them including:

1. Standing water downstream Saddle Dam 3 and Saddle Dam 4;
2. Unstable blocks and loose rocks at Quarries 3, 7, 9, 10, 12, 16 and 23;
3. North access Esker 3 ramp undercut;
4. Granular fill erosion off geomembrane at Tanks 1, 3, 4, 5 at Baker Lake;
5. 300 mm hole in geomembrane at Tank 1 at Baker Lake;
6. Bituminous geomembrane liner damage at 20 Jet A fuel tanks;

AEM has provided responses to all items noted in Appendix 11. While responses have been provided to issues raised as noted above, in the case of those associated with repeat inspection recommendations, it is concerning when items are flagged on a year over year basis, without any actual field work being done to correct the concern. In the case of the new items raised, some of the responses are conditional and lack specific commitments for action or when actions may be undertaken.

**Recommendation 4:** CIRNAC requests that AEM address the continued ongoing issues of culvert obstruction, blockage, or not being properly located. If continued monitoring is proposed, AEM should undertake a risk assessment of potential impacts associated with failure of the culverts during freshet or major storm events.

CIRNAC also requests that no unsafe hazard conditions resulting from physical works (e.g., unsafe slopes, loose rocks, etc.) be left “as-is” once such conditions have been identified. AEM should list all such conditions and set out a timeline for addressing them.



# AGNICO EAGLE

## **Agnico Eagle's Response:**

*The recommendation from the annual report are listed with a priority level (P1 to P4). Some of these recommendations are high priority item (P1, P2) while other are best management practices or event where a single occurrence of deficiency would not results in any impact (P3, P4). For this reason, it is possible that some recommendations get repeated from year to year without representing a concern to safety of worker or to the environment.*

*It is Agnico's opinion that the implementation plan is sufficient to address the recommendation of the annual geotechnical inspection and that no unmanageable unsafe condition are left outstanding from the 2018 annual inspection. For future annual inspection, Agnico will add the priority level of the recommendation in the implementation plan with a timeline.*

## **3.5 Updated Socio-economic Monitoring Program**

**References:** NIRB Project Certificate No. 008, Conditions 45, 46, and 50; 2018 Annual Report, Section 11.10.2

**Concern:** AEM states its Whale Tail Socio-economic Monitoring Program will be submitted to the NIRB by June 30, 2019. This monitoring program will be provided as part of an updated Kivalliq Projects Socio-economic Monitoring Program (i.e., specific to the Meadowbank, Whale Tail, and Meliadine projects). Condition Nos. 45 and 46 of the Whale Tail NIRB Project Certificate require AEM to provide an updated Kivalliq Projects Socio-economic Monitoring Program.

**Recommendation 5:** CIRNAC will review the updated Kivalliq Projects Socio-economic Monitoring Program following its submission to the NIRB. Conditions 45 and 46 of the NIRB project certificate remain unfulfilled until the Whale Tail Socio-economic Monitoring Plan is provided to the NIRB.

## **Agnico Eagle's Response:**

*The scope of the Kivalliq Projects Socio-Economic Monitoring Programs (SEMP) has been updated to include all Agnico's Whale Tail Project. A draft of the updated SEMP was sent to the Kivalliq Socio-Economic Monitoring Working Group (SEMWG), which includes CIRNAC, on June 3<sup>rd</sup>, 2019 for review. Agnico have submitted the SEMP to NIRB on June 29, 2019.*

## **3.6 Staff Schedules**

**References:** NIRB Project Certificate No. 008, Conditions 48; 2018 Annual Report, Section 11.11.11



**Concern:** Pursuant to Condition 48 of the Whale Tail NIRB Project Certificate (No. 008), AEM is required to submit staff schedule forecasts to the NIRB six months prior to the commencement of each project phase (i.e., construction, operations, and closure). AEM states that its Construction Phase staff schedule was sent to the NIRB on May 2, 2018 and the schedule will be updated before the project's Operations Phase.

**Recommendation 6:** To streamline the submission of staff schedule forecasts, future annual reports should include copies or hyperlinks to staff schedule forecasts to demonstrate compliance with the project certificate.

**Agnico Eagle's Response:**

*Agnico acknowledge CIRNAC comment. If a staff schedule update is required as per Condition 48, the staff schedule will be hyperlinked or included in the annual report for the respective year.*

### **3.7 Collaboration with the Government of Nunavut on Career Development**

**References:** NIRB Project Certificate No. 008, Conditions 49; 2018 Annual Report, Section 11.11.12

**Concern:** Pursuant to Condition 49 of the Whale Tail NIRB Project Certificate (No. 008), AEM is required to collaborate with the Government of Nunavut's Career Development Officer, Regional Manager of Career Development, and Director of Career Development on a range of career development related topics. At a minimum, semi-annual calls are to be held and summary information provided to the NIRB in annual report submissions. In its annual report, AEM states it will initiate discussions with the Government of Nunavut on the requirements of this project certificate condition in 2019.

**Recommendation 7:** To ensure compliance with the project certificate, CIRNAC recommends that AEM provide written summaries of meetings it has with the Government of Nunavut on career development initiatives specific Nunavummiut in future annual report submissions.

**Agnico Eagle's Response:**

*Agnico will include a description of the points of discussion and outcomes from the semi-annual calls in the annual reports.*

### **3.8 Annual joint "AEM Kivalliq Projects" Socio-economic Monitoring Reports**

**References:** NIRB Project Certificate No. 008, Conditions 50; 2018 Annual Report, Section 11.10.3



**Concern:** Pursuant to Condition 50 of the Whale Tail NIRB Project Certificate (No. 008), AEM is required to produce annual joint "AEM Kivalliq Projects" Socio-economic Monitoring Reports for the Meadowbank, Whale Tail, and Meliadine projects. AEM will provide their 2018 socio-economic monitoring report to the NIRB by June 30, 2019 in accordance with the timeline agreed upon in the AEM Socio-economic Monitoring Working Group's terms of reference.

**Recommendation 8:** CIRNAC will review the final 2018 socio-economic monitoring report once it is made available for review by the NIRB.

**Agnico Eagle's Response**

*A draft of the updated SEMP was sent to the Kivalliq Socio-Economic Monitoring Working Group (SEMWG), which includes CIRNAC, on June 3<sup>rd</sup>, 2019 for review. Agnico have submitted the SEMP to NIRB on June 29, 2019.*

### **3.9 Monitoring demographic changes**

**References:** NIRB Project Certificate No. 008, Conditions 53; 2018 Annual Report, Section 11.10.3 and 1.10.3.1.1.1

**Concern:** Pursuant to Condition 50 of the Whale Tail NIRB Project Certificate (No. 008), AEM is required to collect and provide project-specific data concerning employee community of residence and number of employees that relocated from the year prior, based on the availability of information. Section 11.10.3.1.1.1 of the 2018 Annual Report provides information on the home communities of Inuit employees for the years 2017 and 2018. Information on the number of Inuit employees that relocated from 2017 to 2018 cannot be found. However, this information may be provided in the upcoming Socioeconomic Monitoring Report submission (to be provided to the NIRB by June 30, 2019).

**Recommendation 9:** To ensure compliance with the project certificate, CIRNAC will review the upcoming 2018 Socio-economic Monitoring Report to confirm whether information is provided on the number of Inuit employees who relocated from 2017 to 2018.

**Agnico Eagle's Response:**

*A draft of the updated SEMP was sent to the Kivalliq Socio-Economic Monitoring Working Group (SEMWG), which includes CIRNAC, on June 3<sup>rd</sup>, 2019 for review. Agnico have submitted the SEMP to NIRB on June 29, 2019.*

### **3.10 Access to housing**

**References:** NIRB Project Certificate No. 008, Conditions 61; 2018 Annual Report, Section 11.11.6



**Concern:** Pursuant to Condition 61 of the Whale Tail NIRB Project Certificate (No. 008), AEM is to "collaborate with the Government of Nunavut and the Nunavut Housing Corporation to investigate measures and programs designed to assist Project employees with pursuing home ownership or accessing affordable housing options in the Kivalliq region. The Proponent should provide access to financial literacy, financial planning, and personal budgeting as part of the regular Life Skills Training and/or Career Path Program." In its annual report, AEM indicates that it has been unsuccessful in collaborating with the Nunavut Housing Corporation to date but it will continue to reach out to this organization to address home ownership and affordable housing options.

**Recommendation 10:** To ensure compliance with the project certificate, CIRNAC recommends that AEM to continue its efforts to coordinate with relevant Government of Nunavut departments on training efforts. Measures taken to address this project certificate condition should be summarized in future annual reports.

**Agnico Eagle's Response:**

*Agnico acknowledges CIRNAC's comment and will continue to make efforts to comply with Condition 61.*

### **3.11 Community infrastructure monitoring**

**References:** NIRB Project Certificate No. 008, Conditions 62

**Concern:** Pursuant to Condition 62 of the Whale Tail NIRB Project Certificate (No. 008), AEM is to work with the Government of Nunavut to develop an effects monitoring program that identifies project-related pressures to community infrastructure in all point-of-hire communities in the Kivalliq region. This effects monitoring program could not be found in the submitted Annual Report.

**Recommendation 11:** CIRNAC recommends that AEM ensure an effects monitoring program is developed with the Government of Nunavut to identify project-related pressures to community infrastructure in all point-of hire communities in the Kivalliq region. Once available, the results of this monitoring program for the year 2018 should be provided to the NIRB. Subsequent results should be provided to the NIRB in future annual report submissions.

**Agnico Eagle's Response:**

*Agnico Eagle's Kivalliq Socio-Economic Monitoring Program (KvSEMP) includes measures to monitor project-related pressure to community infrastructure in Baker Lake and Rankin Inlet, as these are the communities most affected by Agnico's mining activities. Results of*





*monitoring are included in Agnico's 2018 Socio-Economic Monitoring Report, submitted to the NIRB on June 29, 2019.*

### **3.12 CIRNAC Inspection 2018 reporting period**

**Concern:** On August 29, 2018, CIRNAC's WRO performed an inspection of the AEM's Meadowbank Gold Mine site, authorized under water licence no. 2AM-MEA1525. The site visit included an inspection of the hazardous waste laydown area located near the main camp, Goose pit, the Vault Road area, Vault pit, the sewage treatment plant, Tailings pond, Tailings Reclaim Pond North Cell, South Cell Tailings Pond, the Baker Lake marshalling facility and the runway. No non-compliance with the Act or Licence was noted during the inspection. The Water Resource Officer did request the following documents/information:

- Active life of each remaining pit (Not Received)
- Report the tailings spill that occurred near the south cell (Completed, Spill #18-353)
- Water meter usage for both the camp and the mill (Received on August 30th 2018)
- Keep the Inspector updated with major milestones at the Meadowbank site.
- Most recent sample results from ST-40.2 and 40.3 (Not Received)

**Agnico Eagle's Response:**

*Agnico would like to mentioned that the information requested by the Inspector for the two bullets point above identified as 'Not Received' was provided in an email dated September 5, 2018. An email was received from the inspector to acknowledge receipt.*

## **4 Kivalliq Inuit Association (KIA)**

### **4.1 Lake Level Monitoring - MBK**

**References:** Annual Report 4.2 Lake Level Monitoring, 4.2.1 Meadowbank Site

**Concern:** AEM provides the baseline lake level for Second Portage Lake (133.1 masl), as well as its average and range for 2018. The baseline information is lacking for Third Portage Lake and Wally Lake. Without this information it is not possible to evaluate whether changes in lake levels since mine activity are of concern.

**Recommendation 1:** The KivIA recommends that AEM include the baseline water levels for all three Meadowbank lakes for comparison to the range in the current monitoring year.



**Agnico Eagle's Response:**

*Agnico will refer to Section 12.1.2.1 - Water Quantity, of the 2018 Annual Report, which discusses that comparison and provides figures for data collected since monitoring began.*

## **4.2 Water Balance Water Quality Model Reporting Summary - MBK**

**References:** Annual Report 4.4.2 Water Balance Water Quality Model Reporting Summary, 4.4.2.1 Meadowbank Site

**Concern:** The 2018 water quality forecast updates predictions on what parameters may exceed CCME guidelines in pits at closure, and thus require treatment. Twelve parameters are identified, including three that were not predicted in 2017: mercury, lead and total ammonia. AEM does not explain why these additional parameters are now predicted to exceed limits at closure.

**Recommendation 2:** The KivIA would like an explanation from AEM for why mercury, lead and total ammonia are predicted to exceed CCME guidelines in pits at closure.

**Agnico Eagle's Response:**

*The reason why mercury and lead are predicted to exceed limits at closure is the same. The Water Quality Forecast for 2018 considered the extension of the Life of Mine at Meadowbank, which adds the processing of ore body coming from the Whale Tail Pit at the Amaruq site. The ore body from Whale Tail pit has a different geochemical behavior when compared to the Portage/Goose/Vault ore bodies. It has a higher potential to leach mercury and lead. For this reason, mercury and lead were identified as new parameters of concern in this year's model.*

*For total ammonia, during the summer of 2019, it is forecasted to transfer Reclaim Water from the South Cell to the Goose Pit, which contains ammonia. As the forecast water quality model is a conservative one, no degradation of ammonia is considered over time. This means that the total ammonia load present in the Reclaim Water will continue to accumulate in the system, resulting in a concentration in Goose Pit higher than the CCME guideline. However, at closure, the ammonia concentration should be lower than the forecasted value since it should degrade over time.*

*During operation, Agnico will continue to monitor regularly the water quality at the TSF and in the pits and compare the values measured against the forecasted values.*



### 4.3 Water Quality Vault - MBK

**References:** Annual Report 4.4.2 Water Balance Water Quality Model Reporting Summary, 4.4.2.1 Meadowbank Site and 4.4.3 Predicted vs Measured Water Quality, 4,4,3,1 Meadowbank Site

**Concern:** In Section 4.4.2.1, the 2018 water quality forecast predicts that no treatment will be necessary for Vault Pit during re-flooding. It is not clear how this conclusion was reached. Section 4.4.3.1 shows that most parameters have exceeded predicted water quality values by more than 20% in Vault Pit since 2012, and several parameters have exceeded CCME guidelines from 2014-2017 and in 2018. In particular un-ionized ammonia, ammonia nitrogen, fluoride, dissolved cadmium, nitrate.

**Recommendation 3:** The KivIA would like AEM to clarify why no treatment is predicted to be necessary for Vault Pit at closure, despite current and past exceedances of CCME guidelines in several parameters.

**Agnico Eagle's Response:**

*During re-flooding of Vault Pit, no treatment is necessary because the pit will be flooded with the water coming from the Wally Lake (i.e., a water that doesn't exceed CCME guidelines). With a significant inflow volume of clean water, the parameters that exceed CCME guidelines, such as un-ionized ammonia, ammonia nitrogen, fluoride, dissolved calcium, and nitrate will be attenuated.*

*Before breaching the pit, a certain time will be allowed for the suspended solids to settle at the bottom of the pit. Water quality will be monitored during pit re-flooding and the dike will only be breached if the water quality meets the final closure discharge criteria.*

### 4.4 Predicted vs Measured Water Quality – Vault Pit Ice Wall

**References:** Annual Report 4.4.3 Predicted vs Measured Water Quality, 4.4.3.1 Meadowbank Site

**Concern:** Vault Pit experienced 64% higher runoff volume in 2018 compared with the predicted amount. AEM suggests that this may have been due, in part, to “a large ice wall...formed in the Vault pit over the winter months” causing “a higher seepage flow rate entering the pit that was not accounted for in the original water balance” (p. 45). AEM does not indicate the cause of the ice wall, or whether it is likely to be a common occurrence. If it is, the water balance should be updated accordingly.

**Recommendation 4:** The KivIA would like an explanation from AEM on why the ice wall formed in the Vault pit in 2018 and whether it is likely to occur in future winters. Also, it is recommended



that the water balance be updated if the ice wall is predicted to be a common occurrence and provide a discussion as to what changes to the water management plan may be required as a result of this ice wall.

**Agnico Eagle's Response:**

*The first occurrence of the ice wall at Vault was observed in 2017. The source of the ice wall is a water inflow observed on the catchbench at El. 109m. There is a high probability that the source of the ice wall is the water in the nearby attenuation pond. From 2017 to 2019 it has been observed that the ice wall formation was getting bigger year after year as the pit became deeper.*

*As mining activity are over in Vault Pit it is considered that the ice wall water inflow will contribute to the natural reflooding of the pit. This information will be updated in the water balance.*

#### **4.5 Predicted vs Measured Water Quality – MBK Detection Limits**

**References:** Annual Report 4.4.3 Predicted vs Measured Water Quality, 4.4.3.1 Meadowbank Site

**Concern:** The differences between measured and predicted values for many pit water quality parameters are greater than +/- 20%, the model prediction accuracy benchmark outlined in the Water Licence. AEM suggests that one reason for this is that “some accredited laboratory water quality measurements have detection limits that are higher than the predicted values” (p. 58), especially for dissolved metals (e.g., cadmium, iron, lead, nickel, molybdenum, selenium, thallium, zinc). The KivIA has highlighted this issue in previous reviews of Meadowbank Annual Reports for the years 2014 to 2017. It is important that parameter levels can be accurately analysed to determine if predictions are being met or exceeded.

**Recommendation 5:** The KivIA recommends that AEM find an accredited lab to analyze pit water quality that can reach the required detection limits for all parameters.

**Agnico Eagle's Response:**

*Agnico will continue to update its water quality model using the best information available. The information contained in Section 4.4.3.1 of the 2018 Annual Report is based on the comparison of actual water quality obtained from samples taken on site, with prediction provided in the FEIS water quality model. Agnico intends to continue the comparison as required by the Water License. Additionally, Agnico completes yearly an updated water quality forecast for the Meadowbank site, as required by the Water License. Updated annually, this model is developed to predict water quality at closure. The model uses the most recent data from on-site sampling to update the forecast model.*



*Sample results used for modelling are from analysis conducted by an accredited laboratory.*

*The laboratory services selected by Agnico are conducted by accredited facilities and reach the analysis lower detection limits (LDL) where the results can be compared to the CCME guidelines. Agnico Eagle will continue to ensure that the accredited laboratory can reach the required detection limits.*

#### **4.6 Geochemical Monitoring - MBK**

**References:** Annual Report 5.1 Geochemical Monitoring, 5.1.1 Meadowbank Site

**Concern:** AEM states that no further quarry surface water sampling will be conducted “unless there are significant changes during reclamation”, since “follow-up water sampling has not provided evidence of geochemical issues in the quarries” (p. 66). Water sampling data are not provided to support this conclusion.

**Recommendation 6:** The KivIA recommends that AEM summarize 2018 water quality monitoring results for Meadowbank quarries in the Annual Report

**Agnico Eagle’s Response:**

*There was no water quality conducted in quarries along the AWAR in 2018. Agnico should have specified that there is no more water quality monitoring in quarries since 2012 has previous water sampling has not provided evidence of geochemical issues in the quarries. Agnico will refer KIA to the 2012 and previous Annual Report. The water chemistry in quarries remains consistent between years and due to the isolated nature of the pool, the water collected in the quarry does not likely pose a risk to the aquatic environment. It was recommended that unless turbidity issues are visually observed, surface water quality sampling is not deemed necessary at non-HADD crossings or contact pools. In 2018, no turbidity issues were visually observed so surface water quality sampling was not deemed necessary at quarry contact water pools.*

#### **4.7 Spill Summary**

**References:** Annual Report 7.1 Spill Summary

**Concern:** AEM implemented a spill reduction action plan in 2016 following an increasing number of spills at Meadowbank from year to year (e.g., 422 in 2016). This appears to have reduced the number of spills at Meadowbank in 2018 to 243. A further 129 spills occurred at Whale Tail, for a total of 372 at both sites. According to Tables 7.2-7.4, many of the reportable and non-reportable



spills at Meadowbank and Whale Tail relate to hydraulic oil and diesel leaks and are caused by hydraulic hose failure.

**Recommendation 7:** The KivIA would like an explanation from AEM as to why hydraulic hose failure occurs so frequently and what steps are being taken to rectify this problem. It is recommended that AEM propose steps beyond the current approach which includes routine visual inspections as part of AEM's preventative maintenance approach.

**Agnico Eagle's Response:**

*In 2018, 62% of the hydraulic spills at Meadowbank and Whale Tail were during winter months from January to April and from October to December.*

*Agnico operate Meadowbank and Whale Tail under extreme cold condition during winter, and thus created extra pressure on equipment that can lead to more frequent equipment failure even if good inspection and maintenance were conducted. In 2018, and for the following years, particular attention was paid to operating practices on sites. This included the implementation of stand-down of machinery when conditions did not permit the safe operations of equipment. Thus preventing increased stress on hydraulic systems and overall mechanical parts and maintaining the fleet in proper state. Furthermore, a main loading equipment was parked in 2018 for overhaul and maintenance. During the work, an increased focus was also put on ensuring the hydraulic system was inspected and any correctives measures identified, executed. This included changing all hydraulic hoses and seals.*

*Overall, furthermore to daily visual inspection and preventive maintenance that is in perpetual improvement, Agnico have start to reconstruct equipment and stopped equipment during extreme cold condition for to prevent breakdowns. These action items are part of the spill reduction action plan.*

#### **4.8 MDMER and EEM Sampling - Whale Tail North Construction**

**References:** Annual Report 8.3 MDMER and EER Sampling 8.3.2 Whale Tail Site, 8.3.2.1 Whale Tail North Construction

**Concern:** There were five non-compliance episodes with respect to MDMER regulation at Whale Tail in 2018. One was a failure to collect an effluent sample from the final discharge point, as required on July 27th or 28th. AEM does not explain why this sample was not collected.

**Recommendation 8:** The KivIA would like an explanation from AEM as to why the effluent sample was not collected from the final discharge point at the end of July



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## **Agnico Eagle's Response:**

*The missed sample was mainly due to an internal planning issue. Agnico has conducted a review of its internal planning and communication protocols to ensure compliance in regards to MDMER and other water quality monitoring. Agnico will continue to develop methods and tools that will promote the planning and the timely execution of sampling requirements.*

## **4.9 MDMER and EEM Sampling - Whale Tail North Construction QAQC**

**References:** Annual Report 8.3 MDMER and EER Sampling 8.3.2 Whale Tail Site, 8.3.2.1 Whale Tail North Construction

**Concern:** There were five non-compliance episodes with respect to MDMER regulation at Whale Tail in 2018. One was a failure to analyse radium 226 on August 6. The lab did not provide a sample bottle for the parameter, and by the time AEM noticed the parameter was missing from analysis, discharge had already stopped. Discharge stopped August 27, three weeks after this sampling period. Proper QA/QC procedures should exist to avoid this mishap. In particular, the AEM staff responsible should check sample bottles prior to going out in the field to confirm that all necessary bottles have been sent by the laboratory, and if not, contact the laboratory immediately.

**Recommendation 9:** The KivA recommends that AEM ensure proper QA/QC procedures are in place to avoid this non-compliance in future

## **Agnico Eagle's Response:**

*Agnico has conducted a review of its internal planning and communication protocols to ensure compliance in regards to MDMER and other water quality monitoring. Agnico will continue to develop methods and tools that will promote the planning and the timely execution of sampling requirements.*

## **4.10 Mine Site Water Quality and Flow Monitoring - MBK**

**References:** Annual Report 8.5 Mine Site Water Quality and Flow Monitoring, 8.5.3.1. Meadowbank Site

**Concern:** Table 8.21 shows monitoring data for 2014-2018 for ST-16, NP2, NP1, Dogleg and Second Portage Lake. Values that correspond to half detection limits are bolded. It would be helpful to also highlight values that represent exceedances to the listed regulatory limits.

**Recommendation 10:** The KivA recommends that AEM highlight exceedances to listed regulatory limits, in particular water license, MDMER and CCME, in tables reporting water quality data within the receiving environment



**Agnico Eagle's Response:**

*Agnico acknowledges KIA's recommendation and will highlighted exceedance in the table presented as part of the Annual Report.*

**4.11 Mine Site Water Quality and Flow Monitoring – Exploration WT**

**References:** Annual Report 8.5 Mine Site Water Quality and Flow Monitoring, 8.5.4 Sewage Treatment Plant, 8.5.4.3 Exploration Whale Tail Site

**Concern:** Effluent from the Whale Tail sewage treatment plant was discharged to Whale Tail Lake North Basin. In 2018, there were several exceedances. The fecal coliform exceedance on January 29 was attributed to a faulty UV system; and two oil and grease exceedances, on May 14 and November 19, were attributed to a faulty kitchen grease trap system. AEM does not explain how these problems were fixed

**Recommendation 11:** The KivIA would like an explanation from AEM on what mitigation measures were implemented to reduce the likelihood these effluent exceedances will be repeated.

**Agnico Eagle's Response:**

*For the exceedance on January 29, the faulty UV lamp has been replaced and another sample was taken. The sample results received following the corrective action was <10 UFC/100ml, and thus confirmed that the situation was corrected. A reminder was also given to the operators to ensure good inspection of the system in completed daily. The follow up report, including corrective action, was provide to regulators on March 3, 2018.*

*For May 14 and November 19 exceedance, it was assumed that the exceedance may be due to a fault of the kitchen grease trap system. Subsequent samples of the treated waste water have been taken and have shown no exceedance in total oil and grease (<1 mg/L). Additionally, the waste water effluent point was monitored on a regular basis for signs of oil and grease. Following the exceedance, a tight monitoring of the kitchen grease trap system and the waste water effluent point has been implemented.*

*Overall, Agnico has implemented a better tracking of the sampling results, have worked to optimize the UV system, has reviewed the possibility of cross-contamination sampling, have reminded STP operators of the importance of good inspection/maintenance and to advise Environment Department if any problem leading to potential effluent exceedance are encountered.*





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### 4.12 Spill AWAR / WTHR

**References:** Annual Report 11.7.2 Safety Incidents, 11.7.2.1 All Weather Access Road Meadowbank Site, 11.7.2.2 Whale Tail Haul Road

**Concern:** AEM reports that three environmental spills occurred along the All-Weather Access Road (AWAR) in 2018, compared with 13 along the Whale Tail Haul Road, and 11 in eskers and quarries along the Haul Road. The KivA is concerned that a disproportionate number of spills are occurring in relation to increased activity at the Whale Tail site.

**Recommendation 12:** The KivA would like AEM to discuss potential reasons for much higher rates of spills along the Haul Road compared with the AWAR in 2018, and explain what steps will be taken to reduce the risk of spills along this route in future

**Agnico Eagle's Response:**

*The Whale Tail Haul Road (WTHR) was finalized in 2018. Construction activities required a higher usage and more types of equipment and more grading for road maintenance, truck hauling, seacan and fuel truck as it was the case along the Meadowbank AWAR. The risk to broken equipment while doing construction is higher than just travelling on the road. It's Agnico's belief that the number of spills in 2018 along the WTHR was not disproportionate compared to Meadowbank.*

*All spills were managed appropriately according to Agnico's spill contingency plan. The spills were remediated and contaminated material was deposited in roll-off containment on Whale Tail Site before disposal at the Meadowbank Landfarm. There were no impacts to any watercourses.*

*Agnico will continue the daily visual inspection and preventive maintenance, to prevent spill along the WTHR. If spill frequency do not decrease, Agnico will undertake a more comprehensive assessment of the cause and will include this in the Spill Reduction Action Plan.*

### 4.13 Post-Environmental Assessment Monitoring Program –Aquatic Environment, Water Quality - MBK

**References:** Annual Report Section 12 Post-Environmental Assessment Monitoring Program – Evaluation of Impact Predictions, 12.1 Aquatic Environment, 12.1.2.2 Water Quality

**Concern:** Several parameters exceeded FEIS predictions in 2018. AEM states, however, that none of these had “effects-based threshold values (i.e., CCME criteria)” and all “were below concentrations associated with adverse effects” (p. 333). Consequently, water quality results



were deemed as of low impact to the receiving environment, such as concentrations <1x CCME guidelines. It is not clear how these conclusions were reached for all exceedances of FEIS predictions, since:

(i) several of the listed parameters do in fact have CCME guidelines (e.g., fluoride, iron, nitrate, silver), and

(ii) no evidence is provided to support statement that exceedances will not have adverse ecological effects.

**Recommendation 13:** The KivIA would like clarification from AEM on why parameters with CCME guidelines that exceeded FEIS predictions were not evaluated against the impact scale described in the report. In particular, low impact = concentrations <1x CCME, medium = concentrations 1-10x CCME, high = < MDMR but > 10x CCME, very high = exceed MDMR standards.

**Agnico Eagle's Response:**

*Agnico appreciates this review, and would like to provide the following expansion and clarification of the above-described section of the PEAMP Section 12.1.2.2 (p. 333). Updated text is provided in underlined:*

*'Parameters with results commonly exceeding concentrations predicted in the FEIS in 2018 were: ionic compounds (calcium and magnesium), hardness, and total alkalinity. These water quality constituents do not have CCME guidelines and therefore the magnitude of significance was not explicitly predicted in the FEIS. Previous review of the literature suggests that the observed concentrations of these parameters are well below levels of concern for aquatic life (see discussion in 2018 CREMP Report, Section 4.3.2; p. 49 – 51). Therefore, following the intent of the FEIS magnitude ratings, these constituents would be considered consistent with a "low" magnitude of impact, because measured values regularly exceed baseline concentrations but are below concentrations associated with adverse effects. However, Agnico Eagle is also committing to a more detailed assessment of the significance of changes in these water quality parameters in 2019 (see Section 4.21).*

*Chloride, fluoride, nitrate, and sulphate also exceeded the FEIS predictions for Third Portage Lake, Second Portage Lake, and Wally Lake in at least one sample. However, no results exceeded available CCME guidelines (chloride, fluoride, nitrate) or effects-based CREMP thresholds (sulphate), so these constituents are also considered to represent a "low" magnitude of impact.*

*Most metals were below the FEIS model predicted concentrations except for silicon (all three lakes), strontium (Third Portage Lake) and isolated instances of aluminum, copper,*



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*iron, manganese, and silver. For silicon, no CCME guidelines, CREMP triggers or thresholds are available. Measured concentrations in the Meadowbank project lakes (i.e., <0.1 to 0.48 mg/L) fall well within range observed in surface water elsewhere in Canada (0.01 mg/L to 0.24 mg/L in the Atlantic regions and 0.3 mg/L to 25.4 mg/L in the Pacific regions – CCME, 2008). Silicon does not have a water quality guideline in Canada, but CCME (2008) notes that it is the second most abundant element in the earth's crust and is considered an essential micronutrient for some aquatic organisms (e.g., diatoms). While this information suggests that the ecological implications of the concentrations currently found at Meadowbank would be negligible, Agnico is committing to a more detailed assessment of the significance of changes in other water quality parameters as described above (e.g., calcium, magnesium, hardness, and total alkalinity) and will include silicon. Strontium consistently exceeded the model predictions for Third Portage Lake, but importantly did not exceed the CREMP trigger (95<sup>th</sup> percentile of baseline) indicating current strontium concentrations are representative of pre-development conditions. While occasional measurements of aluminum, copper, iron, manganese and silver also exceeded FEIS water quality modelling predictions, no measurements exceeded CREMP trigger values (95<sup>th</sup> centile of baseline) or CCME guidelines, so these constituents are also considered to be consistent with a “low” magnitude of impact.*

~~Since no parameters exceeding FEIS modelled concentrations have effects-based threshold values (i.e. CCME criteria), and results for these non-criteria parameters exceeded baseline or trigger values but were below concentrations associated with adverse effects, Therefore, overall, CREMP water quality results were determined to be consistent with the “low” significance (i.e., <1x CCME WQG) rating applied to model predictions in the FEIS.~~

### REFERENCES

CCME. 2008. Canadian Water Quality Guidelines. Retrieved June 18, 2019 from [https://www.ccme.ca/files/Resources/supporting\\_scientific\\_documents/cwqg\\_pn\\_1040.pdf](https://www.ccme.ca/files/Resources/supporting_scientific_documents/cwqg_pn_1040.pdf)

**Recommendation 14:** The KivIA would like an explanation from AEM on why exceedances of FEIS predictions are not expected to have adverse ecological effects.

### **Agnico Eagle's Response:**

*Agnico will refer to KIA Recommendation 13 above.*



#### **4.14 Meadowbank 2018 Water Management Report and Plan – Pit A**

**References:** Appendix 8 Meadowbank 2018 Water Management Report and Plan, Section 2.2.1 Portage Pit Area, page 15. Section 3.1.6 Portage Pit, page 35. Appendix D 2019 Freshest Action Plan, Section 2.1.2 Portage Pit, page 10

**Concern:** In Section 2.2.1 of Appendix 8, AEM states, “Mining in Pits A, B, C, and D (representing the North and Central Portage area) is completed and these areas are currently subject to pit infilling operations with waste rock material (which will form part of fish habitat compensation).” and in Section 3.1.7 AEM states “Since the summer 2017, water pumped from Portage Pits is no longer transferred in the South Cell. This is aligned with the strategy of minimizing water storage in the South Cell. In 2018, water was transferred from the active Pit E to the mined out Pit A.” However, in Appendix D AEM states, “A pumping station is located in pit B (not shown) and will be used to manage runoff water affecting the active mining production area in pit A. The water will be pumped to the South Cell Tailings Storage Facility (TSF).” It is unclear if mining at Pit A has been completed and if water is being pumped to Pit A or the South Cell

**Recommendation 15:** The KivIA would like AEM to clarify if mining at Pit A has been completed and if water is being pumped to Pit A or South Cell

**Agnico Eagle’s Response:**

*Mining of Pit A finished in March 2018. Water from East Dike seepage (when not meeting water quality for discharge) is transferred to Pit A since 2013 and water from Pit E is transferred to Pit A since 2018.*

#### **4.15 Meadowbank 2018 Water Management Report and Plan - FAP**

**References:** Appendix 8 Meadowbank 2018 Water Management Report and Plan, Appendix D 2019 Freshest Action Plan, Section 2 Mill Seepage, page 28

**Concern:** AEM states, “The monitoring program will be re evaluated (as is the case every year) at the end of 2018 to determine if any changes are warranted in 2019.” The 2019 Freshet Action and Incident Response Plan report is dated March 2019, therefore the KivIA assumes that at the end of 2018 AEM reviewed their monitoring program and determined if any changes were warranted for 2019.

**Recommendation 16:** The KivIA would like AEM to indicate if any changes to the monitoring program were deemed necessary and if so, describe the necessary changes.



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### **Agnico Eagle's Response:**

*After review of the 2018 monitoring program, it was determined that the Freshet Action Plan is correctly adapted and thus does not required any modifications.*

### **4.16 Meadowbank 2018 Water Management Report and Plan – Snow Management**

**References:** Appendix 8 Meadowbank 2018 Water Management Report and Plan, Appendix D 2019 Freshet Action Plan, 2019 Snow Management

**Concern:** AEM states, “In past years when snow is being removed from road surfaces and pushed off the road or when snow is being removed from stream crossings there has been lots of excess road material pushed into the stream crossings.” The build up of excess road materials in stream crossings could impede fish crossings and alter flow within stream crossings

**Recommendation 17:** The KivIA would like AEM to describe the management practices that are being completed to ensure the excess road material in stream crossings is not impeding fish passage or increasing the likelihood of over topping when clear span bridges have not been employed

### **Agnico Eagle's Response:**

*All snow near, in stream crossing and around culvert that naturally accumulated during winter was all removed before the freshet. Agnico have also established restricted zone where snow cannot be stored during winter, mainly near the water crossing. Those practices help to avoid impeding or over topping the stream.*

*Agnico did not notice in 2018 excess of road material in the stream. Yearly discussions with key departments involved in snow management along with coaching and a better supervision on operators was undertaken to ensure best management practices were followed.*

*If excess road material were to be found in the stream, Agnico will be able to take necessary action in advance of the freshet as weekly inspection of these areas are conducted. The inspections are increased to a daily frequency during the freshet period. Further to daily inspections, water quality monitoring was performed as per the Freshet Action Plan. In 2018, there was no water quality issues in stream and no flow restriction were observed.*

### **4.17 Whale Tail Hydrodynamic Modelling for Mammoth Lake**

**References:** Appendix 16 Whale Tail Hydrodynamic Modelling for Mammoth Lake, Section 5.4 Water Quality, pages 1 and 3



**Concern:** AEM states, “A second temporary increase in predicted total phosphorus concentrations occurs from inflow of WRSF seepage at the beginning of the post-closure (Figure 17). The WRSF runoff is predicted to have higher concentrations of total phosphorus than Mammoth Lake when the runoff begins at the start of the post-closure. The highest predicted total phosphorus concentration of the WRSF runoff during post-closure is 1.4 mg/L (Golder, 2018).” A total phosphorus concentration of 1.4 mg/L represents hypereutrophic conditions and is much higher than background conditions. This value is not reflected in Figure 17 on page 3.

**Recommendation 18:** The KivIA would like AEM to clarify if the highest concentration of the WRSF runoff during post-closure is 1.4 mg/L. Please indicate the size of the mixing zone in which phosphorus concentrations will be elevated by at least one trophic level above that in the rest of Mammoth Lake.

**Agnico Eagle’s Response:**

*Yes, these are the results the model showed, though they are highly conservative, a more recent refinement of the model shows that the highest predicted total phosphorus concentration of the WRSF runoff during post-closure is updated to be 0.021 mg/L. This occurs only during low flow conditions in July and August; higher flow conditions in June and September show predicted total phosphorus concentrations of 0.011 to 0.012 mg/L. Given the small volume of runoff carrying these concentrations, it is unlikely to cause changes in trophic level in Mammoth Lake. Slightly higher concentrations may be expected in the mixing zone; however, given the lower phosphorus concentrations in the runoff, a change in trophic level within the mixing zone is not expected. In addition, modeling of the hydrology within the Whale Tail WRSF has been completed in 2019, which shows that there will be no seepage from the pile to Mammoth Lake in post-closure.*

#### **4.18 Meadowbank and Whale Tail 2018 CREMP – Sequential Extraction**

**References:** Appendix 31 Meadowbank and Whale Tail 2018 Core Receiving Environment Monitoring Program, Section 2.3.1, page 28

**Concern:** AEM states, “The sequential extraction test results failed the QA/QC assessment in two rounds of analysis. In the original set of analyses, the samples were incorrectly processed (i.e., pulverized) by the laboratory prior to analysis using the sequential extraction procedure. The effect on the data was anomalously high concentrations of most metals in sequential extraction steps... Maxxam was conducting additional analyses on the sediment to determine the source of the error while the 2018 CREMP report was finalized. The sequential extraction test results were not included in the discussion of sediment metals bioavailability at TPE, WAL, or the Whale Tail study areas.” Since the study results were deemed inaccurate and the bioavailability of metals in



the sediment of TPE, WAL and Whale Tail was not quantifiable, the KivIA recommends that AEM complete another sequential extraction study once the source of the error is determined.

**Recommendation 19:** The KivIA would also like AEM to indicate if another sequential extraction study will be completed in 2019 to determine sediment metals bioavailability at TPE, WAL and Whale Tail since the 2018 results did not meet the data quality objectives

**Agnico Eagle's Response:**

*Maxxam was unable to resolve the QA/QC issues identified with the 2018 testing, resulting in Azimuth's lack of confidence in the sequential extraction procedure (SEP). While the SEP had been used successfully in the past without any QA/QC issues, our experience last year led us to explore alternative tools given the unreliability of the SEP. For 2019, Agnico plan on repeating the sediment toxicity testing (chironomid and amphipod tests) and coupling that with sediment porewater analyses to directly measure metals concentrations to address bioavailability (i.e., porewater analyses will replace the SEP).*

#### **4.19 Meadowbank and Whale Tail 2018 CREMP – Water Chemistry**

**References:** Appendix 31 Meadowbank and Whale Tail 2018 Core Receiving Environment Monitoring Program, Section 3.3 Water Chemistry, page 39

**Concern:** AEM states, "Four water quality results were flagged as unreliable and excluded from formal analysis: (total copper in WAL-79 [May], dissolved Zinc in SP-111 [May], dissolved chromium in TSP-60 [May], and dissolved lead WAL-81 [July])." The results were flagged as outliers during initial analysis of the data. The statistical method used to determine that these values were outliers was not indicated.

**Recommendation 20:** The KivIA would like AEM to indicate the statistical method used to determine the four values were outliers or direct the reader to documents describing the methodology used.

**Agnico Eagle's Response:**

*Visual methods were used to identify these outliers. This approach involved two steps: (1) observation of elevated concentration for a parameter/event/sample combination and (2) spatial-temporal assessment. The latter involves comparing the result to local (i.e., relative to the other sample collected for that event at that area) and regional (i.e., relative to other sampling areas) results for that event and over time. For most of these parameters (i.e., dissolved Cu, Pb and Zn), they are infrequently detected (i.e., >90% are <MDL) and the elevated results are easy to classify as outliers. Total copper was the only*





*case where most values are reported >MDL; in this case the spatial-temporal assessment clearly shows that the single May value at WAL is not consistent with the other data.*

#### **4.20 Meadowbank and Whale Tail 2018 CREMP - QAQC**

**References:** Appendix 31 Meadowbank and Whale Tail 2018 Core Receiving Environment Monitoring Program, Section 3.3 Water Chemistry, page 39; Appendix 37 Meadowbank 2018 Groundwater Monitoring Program Report, Section 2.5.2 Duplicates, field and trip blank; Appendix 38 Whale Tail 2018 Groundwater Management Monitoring Report, Attachment A 2018 Westbay Sampling Technical Memorandum, Section 5.0 Quality Assurance/Quality Control, page 10

**Concern:** AEM states, “The few exceedances of the established data quality objectives (DQOs) represent much less than 1% of the total QA samples and parameters measured – there were only nine out of over 1,200 field duplicate RPD values that exceeded 50%.” In the KivIA’s experience, 50% is not a standard value for RPD analysis.

In Appendix 37 AEM states, “USEPA (1994) indicates that an RPD of 20% or less is acceptable.” This reference is also included in Appendix 38 where AEM states, “Per USEPA recommended methods (USEPA, 1994), an RPD of 20% or less was considered acceptable.”

**Recommendation 21:** The KivIA recommends that AEM compare RPD values to a standard value (e.g.: 20% as recommended by the USEPA) or provide a reference supporting the use of a 50% RPD for comparison

#### **Agnico Eagle’s Response:**

*CCME’s Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment: Volume 1 Guidance Methods and Volume 4 Analytical Methods (2016) both recognize that field duplicates are inherently more variable than laboratory duplicates. Consequently, they state that acceptance limits for field-based QC are broader than laboratory QC and are typically 1.5 to 2 times the laboratory QC limits. The Guidance Methods (CCME 2016) state that “quantifying acceptable precision is a matter of judgement, but assuming that field and laboratory error are similar in magnitude, acceptance criteria twice those given above [sic for laboratory QC limits] would result. Consequently, an RPD of 40% for surface water field duplicate samples would be consistent with CCME guidance.*

*The Guidance Methods (CCME 2016) also states that “near to the detection limit, acceptance criteria are relaxed...within 5X of the LRL [sic laboratory reporting limit]...duplicate concentrations should be less than 2X the LRL.” Further, they note that*





*“the importance of reduced precision becomes more important when concentrations straddle or are near regulatory guidelines.”*

*Thus, the acceptance criteria for field duplicate QC samples recommended by CCME (2016) will be adopted for the 2019 CREMP.*

#### **4.21 Meadowbank and Whale Tail 2018 CREMP - Trend**

**References:** Appendix 31 Meadowbank and Whale Tail 2018 Core Receiving Environment Monitoring Program, Section 4.3.2 Temporal and Spatial Trends, pages 49 - 53 and Figure 2-2

**Concern:** AEM states, “The Meadowbank project lakes (NF locations only) were screened against site-specific trigger and threshold values developed for the Meadowbank project lakes and Walley Lake.” AEM then indicates that conductivity/hardness exceeded trigger values in TPN, TPE, SP and WAL; calcium, magnesium, potassium and sodium exceeded trigger values in TPN, TPE, SP and WAL; TDS exceeded trigger values in TPN, TPE, SP and WAL; and alkalinity exceeded trigger values in SP and TPE. Furthermore, AEM states, “the trends described above are clearly mine-related.” And indicates, “The same list of parameters that exceeded the Meadowbank trigger values typically exceeded the concentrations predicted in the FEIS, namely ionic compounds (calcium and magnesium), hardness, and total alkalinity.”

According to AEM’s Management response plan for the Meadowbank Mine Aquatic Environment Monitoring Program Figure 2-2 an exceedance of an early warning trigger(s) requires an assessment of the magnitude of the change, the spatial scale of the change and the reversibility of the change. AEM has assessed the magnitude of the change and completed a literature review describing some of the possible effects of the increased concentrations.

The KivIA is concerned however, that AEM has not discussed the implications of these increasing concentrations on the community composition of phytoplankton, zooplankton nor benthic invertebrate. Changes in community composition at these lower trophic levels of the aquatic ecosystem may have implications for higher trophic levels.

The KivIA is further concerned that AEM has neglected to assess whether these trends in water chemistry are reversible nor have they determined their spatial extent.

**Recommendation 22:** The KivIA recommends that AEM complete the following:

i) Investigate the source of these parameter increases, their spatial extent and the reversibility of these trends.



- ii) Discuss the implications of increased conductivity, calcium, magnesium, potassium, sodium, TDS and alkalinity at the near-field sites on lower trophic levels, specifically in terms of the community composition of phytoplankton, zooplankton and benthic invertebrates.
- iii) In accordance with AEM Management Response Plan for the Meadowbank Mine Aquatic Environment Monitoring Program, that AEM increase monitoring frequency at the mid-field sites to determine the spatial extent of exceedances observed in the near-field during the open water season.
- iv) Conduct an investigation of cause study for the observed changes in water chemistry and determine possible management strategies.

**Agnico Eagle's Response:**

*The Management Response Plan (MRP) is shown in Figure 2.2 of the 2018 CREMP report. However, details of the MRP are laid out in the 2015 AEMP document, which describes the AEMP-related monitoring programs, how they are cross-linked, and the MRP. The 2015 report states that "management actions will be taken in cases where integrated evaluation of results across AEMP programs identifies a potential impact to the receiving environment; the scope of management actions will depend on the nature of the problem, the spatial scale, evidence for causality, permanence and uncertainty." This recognizes that the management actions are tailored to the situation and are not prescriptive. In the present case, none of the parameters shown to have increased due to mining have effects-based threshold values (i.e., the early warning triggers are based solely on statistical comparisons rather being set relative to an effects-based threshold). This situation is also considered in the results-based sampling strategy that dictates monitoring requirements at mid-field and far-field areas (see Section 2.2.3 of the 2018 CREMP report). Further, information from the literature suggests that none of the observed changes are close to concentrations of concern for aquatic life (i.e., assessment of negligible risk). Consequently, no further management actions were recommended other than tracking the temporal and spatial trends.*

*While Agnico has been managing the mine-related changes in water quality according to the MRP, we acknowledge that the supporting information could be better packaged to document the rationale for the recommended management action. To that end, Agnico will commission a technical memorandum that addresses elements i) and ii) of the stated concerns above and includes an assessment of uncertainty; this memorandum will be included as an appendix in the 2019 CREMP. Should that assessment indicate that elements iii) and iv) are needed to support management decisions, then they will be considered at that time.*



#### 4.22 Meadowbank and Whale Tail 2018 CREMP – Sediment Chromium

**References:** Appendix 31 Meadowbank and Whale Tail 2018 Core Receiving Environment Monitoring Program, Section 4.5.2 Temporal and Spatial Trend Interpretation, page 60, Section 4.6.3 Sediment Metals Bioavailability Study Results, page 67

**Concern:** AEM states, “TPE – Mean sediment chromium concentrations at TPE exceeded the trigger value in 2018 (mean value = 149.9 mg/kg; trigger value = 135 mg/kg; Table 4-7), but were substantially lower than 2017 (204 mg/kg). Chromium concentrations at TPE consistently trended higher between the onset of the mine development in TPE in 2009 i.e., change in status from “before” to “after”) and 2013 (Figure 4-63), likely related to use of ultramafic rock for dike construction.” Since an early warning trigger value has been exceeded according to AEM’s Management response plan for the Meadowbank Mine Aquatic Environment Monitoring Program Figure 2-2 an exceedance of an early warning trigger(s) requires an assessment of the magnitude of the change, the spatial scale of the change and the reversibility of the change. In 2018 only near-field sites had been sampled for sediment. The high mortality of *H. Azteca* in TPE sediment compared to laboratory and field control treatments supports the need for a source tracking study, determining the spatial extent of the elevated chromium concentrations in the sediment and the need for an accurate sequential extraction test.

**Recommendation 23:** The KivIA recommends that AEM complete the following:

- i) Add mid-field and far-field sediment sampling to the 2019 field program to determine the spatial extent of the increased chromium concentration in TPE and discuss the reversibility of the trend.
- ii) Conduct a source tracking study to confirm the source of the chromium. In addition to completing another sequential extraction test in 2019.

**Agnico Eagle’s Response:**

*As discussed in the 2018 CREMP, chromium concentrations decreased in 2019 relative to 2018 and appear fairly stable since 2013. The increasing trend at TPE occurred between 2009 and 2013 (see Figure 4-63 of the 2018 CREMP report). Key results support the conclusion that this trend was restricted to TPE:*

- 1 *Patterns at SP – the east basin of Third Portage Lake drains into Second Portage Lake, which in turn drains into Tehek Lake. Baseline chromium concentrations show natural variability but did not increase between 2009 and 2013 (based on grab and core samples).*
- 2 *Patterns at TE and TEFF – This result was similar for the two Tehek Lake stations, which are downstream of Second Portage Lake. Between 2009 and 2013 (i.e., when TPE was*



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*showing a strong temporal trend), sediment coring was conducted at mid-field TE (2008, 2009, 2012 and 2014) and far-field TEFF (2012 and 2014), and sediment grab sampling was conducted in each of the years. Similar to SP, chromium concentrations at both TE and TEFF were stable over this period. Sample TE this year (conservative based on nothing at SP); do TEFF following year if TE higher.*

*These results indicate that the spatial extent of the increased chromium concentrations is limited to TPE and that expansion of sampling in 2019 to TE and TEFF is not required (i.e., element i) in Recommendation 23).*

*As discussed in the 2018 CREMP report, the source of chromium is most likely related to the introduction of fines from the ultramafic rock used in dike construction. Agnico acknowledges the potential need to explore the source of the chromium in greater detail should the follow-up bioavailability investigation in 2019 confirm that chromium bioavailability is unacceptably high. Thus, the decision to pursue a more definitive investigation of source for chromium in TPE will be deferred until the uncertainties related to bioavailability are addressed.*

### 4.23 Meadowbank and Whale Tail 2018 CREMP – Sediment Arsenic

**References:** Appendix 31 Meadowbank and Whale Tail 2018 Core Receiving Environment Monitoring Program, Section 6.5.2 Temporal and Spatial Trend Interpretation, page 252

**Concern:** AEM states, “Arsenic was the only parameter to exceed site-specific trigger values in 2018. However, the lack of any temporal trend suggests that this reflects an inappropriate trigger value rather than changes to sediment quality.” This statement does not provide rationale as to how an exceedance of a trigger value reflects an inappropriate trigger value.

**Recommendation 24:** The KivA recommends that AEM provide rationale as to why exceedance of an arsenic trigger value for sediment quality reflects an inappropriate trigger value.

#### **Agnico Eagle’s Response:**

*The rationale for the quoted statement is apparent from looking at the arsenic results since 2006 (see Figure 4-61 of the 2018 CREMP report). Results for reference area INUG clearly show the influence of natural spatial heterogeneity, presumably due to the presence of arsenic-rich mineralization; one or more samples exceeds the arsenic trigger of 121 mg/kg dry wt in INUG nearly every year. The trigger for WAL (44.5 mg/kg dw) was set using the baseline results for that lake only (i.e., because many sediment parameters in WAL exceeded the regional triggers set for the Meadowbank project lakes). Thus, while there is no apparent temporal trend in arsenic at WAL, naturally variable sampling results*



*end up exceeding the statistically-derived trigger. Thus, the trigger is “inappropriate” only that, similar to INUG, it is often exceeded despite the lack of any apparent temporal trends.*

#### **4.24 Meadowbank and Whale Tail 2018 CREMP - Spill**

**References:** Appendix 31 Meadowbank and Whale Tail 2018 Core Receiving Environment Monitoring Program, Appendix B3 Water Chemistry – Baker Lake, pages 1 and 2

**Concern:** According to Appendix B3 Water Chemistry – Baker Lake, water quality parameters are often used to identify fuel spills such as oil and grease were not included as part of the 2018 monitoring program. Since one of the major concerns for the Baker Lake monitoring sites is fuel water quality parameters associated with fuel should be included in the water quality monitoring program. This is particularly relevant given the recent expansion of the fuel storage area to accommodate operations at Whale Tail.

**Recommendation 25:** The KivIA recommends that AEM include water quality parameters (i.e. oil and grease) to assess possible fuel spills/leaks to the Baker Lake water quality monitoring program or provide rationale supporting their exclusion

**Agnico Eagle’s Response:**

*Agnico conducts a range of inspections at the Baker Lake Marshalling Facilities related to fuel spills:*

- *Weekly inspection of the Baker Lake Tank Farm*
- *Monthly Fuel Line Inspection*
- *Spill Follow up – spills are managed as per the Spill Contingency Plan*
- *Daily (24/7) monitoring during the fuel transfer from ship to shore. We have the OPEP approved by Transport Canada to mitigate the risk of spill and our responses.*

*Given the importance of this issue, in addition to the annual monitoring of petroleum hydrocarbons and polycyclic aromatic hydrocarbons in sediment adjacent to our facilities included in the CREMP, Agnico will commit to doing a weekly inspection of the shoreline at Baker Lake near our operations during open water season.*

#### **4.25 Blast Monitoring Stations at Meadowbank**

**References:** Appendix 34 Whale Tail Technical Memorandum on Avoidance of Serious Harm to Fish and Fish Habitat, Appendix B – Meadowbank & Whale Tail Project Blast Monitoring Program, 3.3 Blast Monitoring Stations at Meadowbank



**Concern:** Blasts are monitored from three locations at Meadowbank, “chosen to have the optimal distance between the blasts and the water (fish habitat)”. It is not clear how optimal distance is determined. The minimum distance between the blast and fish habitat would seem the best measure

**Recommendation 26:** The KivIA would like AEM to clarify how the optimal distance between the blasts and fish habitat is determined. In particular, does it represent the minimum, maximum or average distance.

**Agnico Eagle’s Response:**

*Agnico uses the minimum distance between the blast and the fish habitat.*

**4.26 Meadowbank 2018 Groundwater Monitoring Program Report - Recommendation**

**References:** Appendix 37 Meadowbank 2018 Groundwater Monitoring Program Report, Section 5, pages 18 and 19. Appendix A – 2018 Groundwater Factual Report, Section 5.1.3 Recommendations for future groundwater monitoring, pages 14 and 15.

**Concern:** SNC-Lavalin has provided a comprehensive list of recommendations for improving and ensuring the continued success of the groundwater monitoring program established in 2017 and 2018. In the groundwater monitoring plan AEM states, “Agnico Eagle will make effort to put in place or use the innovative solutions and best practices when possible to improve the groundwater well installation and sampling program.” AEM also states, “Agnico Eagle will seek new opportunities from forthcoming field campaigns at Meadowbank Mine to collect representative groundwater samples at new locations.”

**Recommendation 27:** The KivIA recommends that AEM:

- i) be specific with regards to what recommendations provided by SNC Lavalin AEM is committed to following to ensure groundwater monitoring success.
- ii) How these recommendations should be incorporated into the groundwater monitoring plan.

**Agnico Eagle’s Response:**

*The Meadowbank 2018 Groundwater Monitoring Plan presented in Appendix 37 of the 2018 Annual Report is considered, since 2017, as the annual report and the monitoring plan and thus, all recommendations detailed in Section 5 are to be followed in further groundwater sampling campaign.*



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### 4.27 Whale Tail 2018 Groundwater Management Monitoring Report

**References:** Appendix 38 Whale Tail 2018 Groundwater Management Monitoring Report, Attachment A 2018 Westbay Sampling Technical Memorandum, Section 2.1 Westbay Well Installation, page 2; Appendix 37 Meadowbank 2018 Groundwater Monitoring Program Report, Appendix A 2018 Groundwater Factual Report, Section 1.1 Background, page 1

**Concern:** AEM states, “The total dissolved solids (TDS) content in the Formation groundwater was determined to range between 2,198 mg/L and 4,042 mg/L (Golder 2016a).” These values are for the Whale Tail Pit area collected at a lower depth than those obtained for the Meadowbank Mine site. Results obtained at the Meadowbank site are from shallower sites and measured TDS concentrations between 52 and 1727.7 mg/L.

SNC Lavalin was commissioned to review historical groundwater throughout the Meadowbank and Whale Tail project area; they provided the following recommendations:

“De-icing salt and calcium chloride brine used to prevent the boreholes from freezing after drilling operation remains in groundwater for years despite intensive purging of wells after installation. When those products are used in boreholes without a dye tracer, it becomes impossible to establish background conditions of groundwater chemistry, despite extensive purging of the wells. Salinity, concentration of calcium and chloride dissolved in groundwater fluctuate from multiple order of magnitude throughout the years and show no logical trend; The sampling methodology used to retrieve groundwater samples induce the sample to be either diluted (sample not collected in front of the well screen) or charged with parameters that come from fine particulates found in dirty water (sediment in suspension in a sample from sumps and horizontal well can induce false results because groundwater samples are collected in bottle with preservatives but are not filtered in the field before adding the water to the bottles with preservatives); and

› Important chemical parameters to establish background chemistry were missing from the data set (major ions dissolve in groundwater).”

The SNC Lavalin recommendations raise the question as to whether differences between measurements collected at Meadowbank and Whale Tail may indicate differences in site specific groundwater chemistry, sample collection depth or methodological differences between SNC Lavalin and Golder that have confounded the results.

**Recommendation 28:** The KivIA recommends for the 2019 annual report that AEM provide a discussion of the implications of adopting SNC Lavalin’s recommendations and whether observed



differences between data gathered at Meadowbank and Whale Tail are due to site specific differences in groundwater chemistry, sample depth collection or methodological factors.

**Agnico Eagle's Response:**

*Agnico acknowledges KIA's comment and will provide requested information in the 2019 Annual Report.*

**4.28 Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report - Wording**

**References:** Appendix 45, Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report, Section 2.5, Overview – Report Objectives, page 9

**Concern:** In the statement “Evaluate the function and validity of implemented monitoring strategies” on page 9. The term “validity” is unusual wording.

**Recommendation 29:** The KivIA would like AEM to clarify what this means.

**Agnico Eagle's Response:**

*Validity refers to the applicability and effectiveness of the monitoring strategy (i.e., is it logically sound). In other words, is the implemented monitoring strategy suitable for achieving the function for which it was established.*

**4.29 Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report – Mitigation Audit**

**References:** Appendix 45, Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report, Section 2.8, Overview – Mitigation Audit, page 10

**Concern:** The proposed Mitigation Audit to begin in 2019 “to evaluate the use and effectiveness of the mitigation, following principals of adaptive management, and to identify additional mitigation measures as required” is a useful idea but as presented lacks detail.

**Recommendation 30:** The KivIA would like AEM to explain why only a summary of the audit will be provided in the annual report, and whether the Terrestrial Advisory Group (TAG) will review and advise on drafts of the audit.

**Agnico Eagle's Response:**

*Agnico will appended an audit report to the annual report if available on time. The conclusion of the Mitigation Audit can be discussed with the TAG.*





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### 4.30 Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report – Roads Surveys

**References:** Appendix 45, Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report, section 3.0, Roads Surveys, page 23

**Concern:** The results from the different monitoring methods are not integrated or correlated, nor are the sequences documenting the management actions recorded. There was no integration of the collar data with the road surveys, incidental sightings and HOL surveys. Although Tables 3.7–3.9 summarize road restrictions, the triggers (e.g., collar locations, road survey observations, HOL survey data, and/or incidental sightings) that led to road closures were not presented.

**Recommendation 31:** The KivIA recommends that the report more clearly show:

i) when and how the decision trees were followed,

**Agnico Eagle's Response:**

*For the 2019 report, a clearer link between monitoring outcomes and management responses will be provided (as per the decision tree approach).*

ii) the sequence of monitoring which led to triggers and mitigation actions,

**Agnico Eagle's Response:**

*Clearer links between monitoring and management will be provided in the 2019 report.*

iii) follow-up monitoring to examine the efficacy of the mitigation.

**Agnico Eagle's Response:**

*Agnico is investigating the possibility of conducting a more comprehensive analysis of the effectiveness of mitigation measures in reducing road-related effects on Caribou movements.*

**Recommendation 32:** The KivIA recommends that more information is needed other than the herd was 'close'. For example, the tables provided in S 3.6.5 Road-related Mitigation are useful giving the frequency and duration of closures but should include the thresholds or sightings that triggered the closures.

**Agnico Eagle's Response:**

*The linkages between monitoring results and mitigation action will be more clearly outlined in the 2019 annual report.*



#### **4.31 Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report – Traffic data**

**References:** Appendix 45, Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report, section 3.0, Road Surveys

**Concern:** Traffic data are an integral component of caribou (and muskox) management, and it is critical that daily mine traffic be presented from all roads. However, in the report traffic frequency data are lacking.

**Recommendation 33:** The KivIA recommends that AEM complete the following:

i) Annual graphs showing haul trucks, medium vehicles (e.g., watering or fuel trucks), and light vehicles (e.g., pickup trucks) compared against predicted traffic levels.

**Agnico Eagle's Response:**

*Agnico acknowledge KIA's recommendation and will evaluate the feasibility to include the requested information in the 2019 annual report. This will also be reviewed during the TAG meeting.*

ii) Have the ATV traffic levels as recorded by security on AWAR presented in graphs as well.

**Agnico Eagle's Response:**

*The monthly AWAR ATVs and snowmobile usage are already provided in Table 11.2 of the 2018 Annual Report.*

#### **4.32 Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report**

**References:** Appendix 45, Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report, section 3.0, Road Surveys– Objectives, page 11

**Concern:** Under the stated objective “Document wildlife utilization along the AWAR, Vault Haul Road, and Whale Tail Haul Road corridors”. The KivIA recommends that it would be more accurate (and measurable) to document wildlife distribution and abundance than wildlife utilization (meaning is unclear).

Under the stated objective “Evaluate wildlife trends along the road corridors, including identifying areas where higher densities of wildlife are observed. Evaluate whether road-related operations preclude Caribou from using suitable habitats beyond 1,000 m. The threshold level along the roads is unnatural Caribou use patterns beyond 1,000 m”.



**Recommendation 34:** The KivIA requires clarification on how are ‘unnatural’ and ‘suitable’ defined, and how will it be determined that caribou are not able to use suitable habitats and demonstrate unnatural use patterns beyond 1 km distance from roads (and beyond 500 m for pits and mine site; s 4.2, pg 30).

**Agnico Eagle’s Response:**

*These threshold levels are an artefact of an earlier version of the TEMP (2006) and will be removed for the 2019 report as they are not in the revised TEMP (Table 14, TEMP v6).*

**Recommendation 35:** The KivIA recommends that these criteria should be defined and added to the Methods and also to the TEMP.

**Agnico Eagle’s Response:**

*Please refer to Agnico’s response to KIA Recommendation 34 above.*

#### **4.33 Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report – Road related mitigation**

**References:** Appendix 45, Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report, section 3.0, Road Surveys– 2018 Results, AWAR, page 13.

**Concern:** The tables on the AWAR surveys (section 3.6.2) demonstrate annual trends and the seasonal numbers but the KivIA recommends that it should be cross-referenced to 3.6.5 Road-related Mitigation.

The figures in this report are very informative. For example, Fig. 3.1 suggests that over half of AWAR had high densities crossing in 2018, and Fig. 3.4 indicates that the highest caribou densities along the Whale Tail haul road in 2018 were observed between Km 5 and 19, and Km 50 and 55, which suggests much of the road needs to be designed as caribou friendly.

Figure 3.2 (cumulative caribou observations) is a good figure, but the KivIA recommends that it could show finer resolution than 5 km sections, perhaps 2 km for better resolution to focus mitigation efforts.

**Recommendation 36:** The tables on the AWAR surveys (section 3.6.2) demonstrate annual trends and the seasonal numbers but the KivIA recommends that it should be cross-referenced to 3.6.5 Road-related Mitigation.

**Agnico Eagle’s Response:**

*The feasibility of implementing this suggestion will be investigated for the 2019 annual report.*



**Recommendation 37:** Figure 3.2 (cumulative caribou observations) is a good figure, but the KivIA recommends that it could show finer resolution than 5 km sections, perhaps 2 km for better resolution to focus mitigation efforts.

**Agnico Eagle's Response:**

*Agnico acknowledge KIA's comment and a 2 km resolution will be used for figures included in the 2019 report.*

#### **4.34 Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report**

**References:** Appendix 45, Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report, section 3.0, Road Surveys– Road-related Mitigation, page 21.

**Concern:** Table 3.7 in the Comments column refers to no caribou monitoring but the road was closed for caribou.

**Recommendation 38:** The KivIA needs AEM to clarify which, if any, closures were due to blizzards in Table 3.7.

**Agnico Eagle's Response:**

*The focus of the annual wildlife report is to document closures due to wildlife presence. Where wildlife and weather-related issues are factors in closure, both will be mentioned.*

#### **4.35 Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report – Arctic hare mortalities**

**References:** Appendix 45, Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report, section 3.0, Road Surveys– Road Related Wildlife Mortality, page 26.

**Concern:** Table 3.10 shows four Arctic hare road-related mortalities in 2018, but Table 3.11 (Cumulative road kill data) does not acknowledge any mortalities of small mammals or any wildlife in 2018

**Recommendation 39:** The KivIA requests that AEM clarify this discrepancy.

**Agnico Eagle's Response:**

*Four Arctic Hare mortalities should have been included in Table 3.11. Careful attention will be paid to ensure consistency in the 2019 report.*



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### 4.36 Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report – Management Recommendations

**References:** Appendix 45, Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report, section 3.0, Road Surveys– Management Recommendations, page 27.

**Concern:** NA

**Recommendation 40:** The KivIA recommends that:

i) these suggestions should already be part of the report

**Agnico Eagle's Response:**

*The recommendation in this Section 3.0 Road Surveys – Management Recommendations are already part of the report and will continue to be implemented in 2019. This section will be revised in the 2019 report for clarity..*

ii) they should be written in such a way as to be measurable based on how and when they will be implemented.

**Agnico Eagle's Response:**

*Management recommendations will be revised to include information on the factors affecting implementation.*

### 4.37 Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report – Roads Closures

**References:** Appendix 45, Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report, section 4. Pits and Mine Site Ground Surveys– Incidental Wildlife Observations, page 32

**Concern:** Table 4.1 (Wildlife Presence Requiring Action) shows nine instances of when a road was closed for caribou but with no details. Most of these observations and resultant closures are not captured in Tables 3.7-3.9: Summary of Road Restrictions.

**Recommendation 41:** The KivIA recommends that this separation of observations by techniques needs some rethinking and re-presentation – perhaps a section on mitigation by topic (road closures) with the different monitoring techniques. This would help evaluate which monitoring methodology is more efficient in coverage and utility, and where there may be gaps and duplications.



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### **Agnico Eagle's Response:**

*The 2019 report will include an integrated section related to Caribou monitoring and mitigation that will ensure that the links between monitoring results and mitigation or management actions are clearly described.*

### **4.38 Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report - Deterrence**

**References:** Appendix 45, Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report, section 4. Pits and Mine Site Ground Surveys— Incidental Wildlife Observations, page 36

**Concern:** Table 4.1 (Wildlife Presence Requiring Action) provides a summary of what appears to be a lot of deterrence of wolverine and wolf required at Meadowbank, especially in Jan-Feb 2018. Deterrence activities in 2018 for wolf and wolverine were the highest recorded over 4 years (Table 4.3). The Summary Report states that AEM employees are using “Well-defined food-handling practices and employee awareness programs”.

**Recommendation 42:** The KivIA requires AEM to provide clarity on why there is a large requirement for deterrence. This unusual attraction may still be related to garbage or the kitchen facility

### **Agnico Eagle's Response:**

*Several factors may explain increased Wolf and Wolverine presence in 2018: 1) Since Wolf and Wolverine population size is cyclical, increased numbers may have been present in the region in 2018; 2) potential limited prey availability may have led to an increase in attraction to the mine site; and 3) attractants may have been more readily available at the mine site in 2018. Waste management at site is in constant monitoring and is addressed by increasing the level of staff training. Employee on site are reminded regularly on proper waste segregation through departmental toolbox meetings and site wide communications. This is to stress the importance of maintaining a proper waste management. In 2018, Agnico continued to conduct weekly visits of the different infrastructures for the waste management as the incinerator, landfill, waste container and all areas around site to assess the performance of the waste management. These practices will be continued in 2019.*

### **4.39 Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report – Caribou**

**References:** Appendix 45, Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report, section 6. Caribou Satellite-Collaring Program - Objectives, page 50



**Concern:** The Summary Report states as if the GN and AEM movement/ZOI studies were never done, but these reports were completed in 2017.

**Recommendation 43:** The KivIA requests that AEM clarify this discrepancy

**Agnico Eagle's Response:**

*A final updated GN report by Kite et al. is expected to be completed at the end of June 2019.*

**Concern:** Figures 6.7 and 6.8 strongly suggest an influence of AWAR and the Whale Tail haul road for deflecting and delaying caribou road crossing, as acknowledged in the text (s 6.6, pg 61).

**Recommendation 44:** The KivIA recommends that the next steps should be:

- i) quantification of these observations,
- ii) better/finer scale reporting of monitoring, and
- iii) mitigation to adaptively reduce the degree of deflection/delaying crossing.

**Agnico Eagle's Response:**

*Agnico will revise and update these sections in the 2019 Annual Report. Among other, clearer links between monitoring results and management decisions (i.e., how the decision tree is being implemented) and caribou monitoring and road management (i.e., mitigation effort) will be outlined in the 2019 report. As well, an integrated section on Caribou monitoring and management will improve clarity.*

#### **4.40 Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report - HOL**

**References:** Appendix 45, Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report, section 7.0, Height of Land Monitoring

**Concern:** The data as presented leads one to question whether HOL surveys are “an effective ‘early warning’ system” (pg 65).

**Recommendation 45:** The KivIA recommends the following:

- i) Fig. 7.1 shows “Maximum observable areas” which are totally unrealistic – some appear to be >10-12 km. These should be capped at 4 km maximum as it is not possible to detect caribou beyond 3-4 km distance.



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**Agnico Eagle's Response:**

*HOL maps will be revised in the 2019 report to reflect this suggestion.*

ii) Table 7.1 (Height-of-Land Survey Data) needs to be compared with road surveys and other triggers for intensified mitigation to see whether the HOL actually contribute to monitoring at distances beyond what the road surveys provide. Did the fall 2018 HOL surveys contribute to Whale Tail haul road monitoring and mitigation? This is not stated in the report.

**Agnico Eagle's Response:**

*The effectiveness of the HOL survey approach will be discussed at future TAG meetings. A discussion on the effectiveness of the approach will be included in the 2019 report.*

#### **4.41 Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report – Remote Camera Monitoring**

**References:** Appendix 45, Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report, section 8.0, Remote Camera Monitoring

**Concern:** No results were provided from the remote camera monitoring and it is unclear how the remote cameras will contribute to monitoring

**Recommendation 46:** The KivIA recommends that the Methodology section should state how the camera data will be used for monitoring and mitigation

**Agnico Eagle's Response:**

*The primary purpose of remote cameras is to document behavioral interactions rather than monitoring Caribou presence or abundance. The 2019 report will provide a more comprehensive discussion on results of the program.*

#### **4.42 Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report – Caribou decision tree**

**References:** Appendix 45, Meadowbank and Whale Tail 2018 Wildlife Monitoring Summary Report, section 9.0, Caribou Management Decision Tree – Management Recommendations, page 74

**Concern:** NA

**Recommendation 47:** The KivIA strongly agrees with the management recommendation “A dedicated log of decisions and outcomes [from the decision tree approach] should be kept in 2019 to facilitate future analyses of the effectiveness of this monitoring approach”.





**Agnico Eagle's Response:**

*Agnico acknowledges KIA's comment.*

## **5 Environment and Climate Change Canada (ECCC)**

### **5.1 Dustfall Sampling Technique**

**References:** Agnico Eagle Mines Limited. Meadowbank Gold Project 2018 Annual Report Appendix 39: Meadowbank and Whale Tail 2018 Air Quality and Dustfall Monitoring Report. April 2019; ASTM International. Standard Test Method for Collection and Measurement of Dustfall (Settleable Particulate Matter) D1739-98. Reapproved 2017; Environment and Climate Change Canada. Meadowbank Gold Project and Whale Tail Project – 2017-2018 Annual Monitoring Report. ECCC Responses to NIRB Recommendations. December 2018; Environment and Climate Change Canada. Technical Review Submission to the Nunavut Impact Review Board Respecting the Whale Tail Pit Expansion Project Proposed by Agnico Eagle Mines Limited. May 2019

**Concern:** The Proponent indicated that dustfall sampling would be conducted in accordance with the ASTM method, and states that, “ASTM methods suggest collection of the dustfall sample at 2-3 m height on a utility pole to prevent reentrainment of particulates from the ground, and to reduce vandalism and potential for wildlife interaction. For locations DF-1 – DF4, samples were collected in this manner” (Page 6, Air Quality and Dustfall Monitoring Report). However, the Proponent also indicated that dustfall samplers would be placed on the ground along haul roads and at remote sites (instead of on poles at a height of two meters as prescribed by ASTM).

The Proponent noted that the reason for the modification of the method was the difficulty in constructing and deploying a large number of sampling stands. The Proponent conducted a study in 2012 with a small number of samples and did not find a significant difference in dustfall rates between samples on the ground versus at a two meter height. The Proponent also indicated that they plan to conduct a supplemental study in 2019 to confirm that dustfall canisters deployed on the ground align with those measured on stands.

As previously indicated by ECCC (in both the ECCC 2018 Response to the NIRB Recommendations and in the ECCC Technical Review Submission for the Whale Tail Pit Expansion Project) the placement of dustfall canisters on the ground can have negative implications on data quality. According to ASTM (2017), at heights below two meters, there is a wider variability in the concentration of particles subject to settling. Sampling close to the ground also increases the chances that measured dustfall can be influenced by accumulated snowfall and interference by wildlife. Therefore, to remove the possible biases in data and to be able to compare measured dustfall to Alberta guidelines appropriately, the dustfall sampling method should be consistent with the ASTM method and consistent across all sites.



**Recommendation 1:** ECCC continues to recommend that the Proponent conduct dustfall sampling for all sampling locations according to the ASTM method (2017), specifically at a sampling height of two meters.

**Agnico Eagle's Response:**

*Agnico acknowledges ECCC's comment. The result of the 2019 study will be provided in subsequent annual report along with sampling method and mitigation measure that will be adopted. Agnico will be available to discuss the 2019 study results with ECCC.*

## **5.2 Canadian Ambient Air Quality Standards**

**References:** Agnico Eagle Mines Limited. Meadowbank Gold Project 2018 Annual Report. April 2019; Environment and Climate Change Canada. Technical Review Submission to the Nunavut Impact Review Board Respecting the Whale Tail Pit Expansion Project Proposed by Agnico Eagle Mines Limited. May 2019.

**Concern:** Since completion of the environmental assessments for the Meadowbank Gold Mine and Whale Tail Pit Projects, the Canadian Council of Ministers of the Environment have established new Canadian Ambient Air Quality Standards (CAAQS) for nitrogen dioxide (NO<sub>2</sub>; November 3, 2017). As previously indicated by ECCC in the Technical Review Submission for the Whale Tail Pit Expansion Project, ECCC recommends that monitoring results be compared to the most stringent air quality standards applicable to a given area. The CAAQS are not intended to be used as enforceable standards at the Project perimeter. Rather, they are used to evaluate the nature and severity of the Project's impact on regional air quality. The passive air quality monitoring for NO<sub>2</sub> produces annual averages that can be compared with the annual NO<sub>2</sub> CAAQS.

**Recommendation 2:** ECCC recommends that the Proponent:

- Provide a comparison of annual average concentrations of NO<sub>2</sub> to the CAAQS in future Air Quality Monitoring Reports.
- Update relevant Management Plans to include the CAAQS

**Agnico Eagle's Response:**

*Compliance with the CAAQS is assessed regionally on an air zone basis. The Meadowbank and Whale Tail Projects are located in Nunavut and the appropriate "given area" for assessing compliance with the CAAQS is the Nunavut air zone.*

*The CAAQS for NO<sub>2</sub> are calculated as follows:*

- NO<sub>2</sub>: 3-year average of the 98<sup>th</sup> percentile of the daily maximum 1-hr NO<sub>2</sub> concentrations.



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*Hourly NO<sub>2</sub> are not measured at Meadowbank and Whale Tail, rather 30-day averages of ambient NO<sub>2</sub> concentrations were measured. At Whale Tail, NO<sub>2</sub> measurement started only beginning of 2019. These observations can be used to compute annual average ambient NO<sub>2</sub> concentration.*

*Agnico Eagle is of the view that it is not appropriate to compare annual averages of 30-day average NO<sub>2</sub> concentration observed at Meadowbank to the CAAQS because:*

- 1) They have differing observational timescales (i.e., 30-day versus hourly);*
- 2) They have differing calculation methodologies (i.e., annual average of 30-day average concentrations versus 3-year average of 98<sup>th</sup> percentile maximum daily 1-hr concentrations);*
- 3) The Whale Tail data have not been collected for a period of 3 years; and*
- 4) Comparison to the CAAQS should be assessed on a regional basis (i.e., for the Nunavut airshed).*

### 5.3 Dust Suppression Activities

**References:** Agnico Eagle Mines Limited. Meadowbank Gold Project 2018 Annual Report, Sections 4.2.1 and 4.2.3.1. April 2019.

**Concern:** Section 4.2.3.1 of the 2018 Annual Report describes locations of some dust suppressant applications (using Tetraflake) to the all-weather access road (AWAR) which occurred on July 9th 2018, as well as in 2017. Section 4.2.1 indicates that water trucks were also used for dust suppression. However the proponent did not provide details regarding the use of road watering. In addition, no information was provided regarding dust suppressant activities for the Whale Tail Haul Road.

Finally, the Proponent did not indicate how dust suppressant activities were triggered, and whether they were in response to dustfall measurements, active particulate matter monitoring, visual dust observations, or community input (e.g., complaints).

**Recommendation 3:** ECCC recommends that the Proponent provide more details regarding dust suppressant activities, including detail on the following:

- The use of road watering, including timing, frequency, and volumes applied.
- Dust suppressant activities for the Whale Tail Haul Road.
- How dust suppressant activities were triggered, including the use of dustfall measurements, active particulate matter monitoring, visual dust observations, and an account of community input on the issue of dust.



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### **Agnico Eagle's Response:**

*Mine site road watering at both Meadowbank and Whale Tail is applied on a daily basis during frost-free season (May to October), as needed. For Meadowbank, the volume of water use for this activity is not recorded as the water tank is the same as the one use by the mill, and thus no distinction is possible. For Whale Tail, a total volume of 1,943 m<sup>3</sup> of water was use for both the mine site and the WTHR. Details of the volume per month is provided in Table 4.2 and 4.3 of the 2018 Annual Report. The 2019 dust suppression activities will continue to follow the Air Quality and Dustfall Monitoring plan (Version 4, March 2019).*

*In 2016, Agnico conducted an initial meeting with the Baker Lake Community Liaison Committee (including an HTO member) on March 18 to discuss the planned dust suppression pilot study. A field visit with HTO members was planned to identify specific areas of concern related to dust along the AWAR. The field visit by members of the HTO and the Meadowbank Environment Department was conducted May 11<sup>th</sup>, 2016, and examined AWAR km 1 – km 50. Three areas of concern were identified, generally due to proximity of Whitehills Lake and water crossings. Please refer to Table below for the rational associated with the segment of the AWAR receiving dust suppression.*

<b>Location Type</b>	<b>Dust Suppression Location</b>	<b>Rationale</b>
Hamlet	Agnico Eagle spud barge area	High traffic area near hamlet
Hamlet	Agnico Eagle tank farm to Arctic Fuel site	High traffic area near hamlet
AWAR	km 10 - 12	High traffic area near hamlet & area of concern to HTO – proximity to lake
AWAR	km 24 - 26	Area of concern to HTO – proximity to lake
AWAR	km 48 - 50	Area of concern to HTO – water crossing
AWAR	km 68 - 70	Location identified by Agnico Eagle – water crossing
AWAR	km 80 - 84	Location identified by Agnico Eagle – proximity to water & crossing
Onsite	Emulsion plant turn off to Meadowbank site (km 103 – 110)	High traffic area onsite

*For the WTHR no concern for community were received to date.*

*Dust suppression along the AWAR and WTHR will be triggered by Air Quality and Dustfall Monitoring plan (Version 4, March 2019)*



#### 5.4 Reconnecting Flooded Pits

**References:** Agnico Eagle Mines Limited. Meadowbank Gold Project 2018 Annual Report, Section 4.4.2. April 2019; Agnico Eagle Mines Limited. Meadowbank Gold Project 2018 Annual Report, Appendix 8: Meadowbank 2018 Water Management Report and Plan. April 2019

**Concern:** Flooding of the mined-out pits will occur until 2030, using both passive and active methods. ECCC advises that prior to reconnecting flooded pits to surrounding waterbodies, the water quality of the pits must be demonstrated to have stabilized and be consistently acceptable for discharge to the receiving environment. Thus, an extended period of water quality monitoring will be required following flooding.

ECCC notes that the interval (approximately 3 to 4 years) between active flooding of the pits and the proposed timing of dike breaching (i.e., approximately 2030) may not allow sufficient time to demonstrate stable and acceptable pit water quality. Further, the 2018 Annual Report and 2018 Water Management Report and Plan indicate that dike breaching is contingent on pit water quality meeting aquatic guidelines and/or site-specific criteria. However, these documents do not address the need to demonstrate stability and long-term acceptability of pit water quality. Monitoring results must demonstrate that water quality is stable and consistently meets guidelines/criteria prior to reconnecting flooded pits to fish bearing waterbodies.

**Recommendation 4:** ECCC recommends that the Proponent, in conjunction with the 2019 Annual Report, revise management and monitoring plans that are relevant to reconnecting flooded pits with surrounding fish bearing waterbodies to clarify that dike breaching is dependent on demonstrating that pit water quality has stabilized and is consistently acceptable for discharge to the receiving environment

**Agnico Eagle's Response:**

*Agnico acknowledge ECCC's comments and will add a precision in the 2019 Water Management Report and Plan.*

#### 5.5 Laboratory Detection Limits

**References:** Agnico Eagle Mines Limited. Meadowbank Gold Project 2018 Annual Report, Section 4.4.3. April 2019

**Concern:** Water quality prediction models for the Meadowbank Gold Mine include a Probable scenario and a Possible Poor End scenario. Measured water quality (yearly mean and lower 25th percentile) for Portage Pit (ST-17 and ST-19), Goose Pit (ST-20), Vault Pit (ST-23) and Phaser Pit (ST-41 and ST-42) were compared to the predicted values (2 model scenarios), water license discharge criteria to Third Portage Lake and Wally Lake, the MDMER and the CCME water quality



guidelines for the protection of aquatic life. These criteria are used as a guide to identify potential parameters of concern.

Per Section 4.4.3.1 of the 2018 Annual Report, many of the predicted values for the Probable and Possible Poor End scenarios have differences greater than +/- 20% when compared to the measured values. Several potential contributing causes were identified, including the following, “Some accredited laboratory water quality measurements have detection limits that are higher than the predicted values. This is particularly true for dissolved metal analysis, such as cadmium, iron, lead, nickel, molybdenum, selenium, thallium and zinc” (Page 58).

ECCC has previously (2016 Annual Report review) noted this issue and raised concern regarding laboratory detection limits that are higher than the predicted values.

**Recommendation 5:** ECCC continues to recommend that the Proponent seek out laboratories with sufficiently low detection limits to be able to properly assess samples, thereby supporting comparison of measured data to predicted values.

**Agnico Eagle’s Response:**

*Agnico will continue to update its water quality model using the best information available. The information contained in Section 4.4.3.1 of the 2018 Annual Report is based on the comparison of actual water quality obtained from samples taken on site, with prediction provided in the FEIS water quality model. Agnico intends to continue the comparison as required by the Water License. Additionally, Agnico completes yearly an updated water quality forecast for the Meadowbank site, as required by the Water License. Updated annually, this model is developed to predict water quality at closure. The model uses the most recent data from on-site sampling to update the forecast model. Sample results used for modelling are from analysis conducted by an accredited laboratory.*

*The laboratory services selected by Agnico are conducted by accredited facilities and reach the analysis lower detection limits (LDL) where the results can be compared to the CCME guidelines. Agnico Eagle will continue to ensure that the accredited laboratory can reach the required detection limits.*

## **5.6 Managing Missing Data**

**References:** Agnico Eagle Mines Limited. Meadowbank Gold Project 2018 Annual Report, Appendix 8: Meadowbank 2018 Water Management Report and Plan, Appendix C – 2019 Meadowbank Water Quality Forecasting Update, Table 3-4. April 2019



**Concern:** Table 3-4 of the 2019 Meadowbank Water Quality Forecasting Update provides the parameter concentrations used in the Water Quality Forecast Model. ECCC notes that fifteen data points (comprised of some, but not all, of the data points for total chromium, strontium, thallium and uranium) in Table 3-4 contain no measured data and are assigned a value of zero, per Footnote (4) which reads: “No data. Assume negligible” (Page 51).

ECCC further notes that no measured values of zero were reported in Table 3-4 among the actual data of affected parameters (i.e., total chromium, strontium, thallium and uranium), and some of the measured results for total chromium and thallium exceed CCME water quality guidelines (long term) or other comparison criteria used to identify potential parameters of concern.

No justification has been provided for assigning a zero value for missing data, and this approach is not supported by the actual water quality measurements.

**Recommendation 6:** ECCC recommends that the Proponent:

- Propose another method for managing missing monitoring data (rather than arbitrarily assigning a value of zero), and provide an accompanying rationale.
- Provide a discussion on why missing chromium and thallium data are assumed negligible in the water quality forecast model when some of the observed measured concentrations exceed CCME water quality guidelines.
- Provide a discussion on why there is no data for fifteen data points in Table 3-4 of the 2019 Meadowbank Water Quality Forecasting Update.

**Agnico Eagle’s Response:**

*The input water quality used in the water quality forecast model is based on water quality analysis sampled regularly on a yearly basis. The model starts in January 2014 using water quality data sampled in 2013 or 2014. The trend of the measured values is then used as a starting point to forecast the water quality till closure.*

*In Table 3-4 of the 2019 Meadowbank Water Quality Forecasting Update, the parameters indicated by a zero value indicate that no analysis was available. The fifteen parameters containing a zero value can be divided into two categories:*

1. *The initial conditions of the model that were established based on water quality data sampled in 2013/2014;*
2. *Average of the values between 2015 to 2018.*

*The first category includes the columns corresponding to the Attenuation Pond/ South Cell 2014, Portage Pit ST-19 2013, and Goose Pit ST-20 2013.*





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*During the majority of 2014, the Attenuation Pond only received surface runoff. Reclaim Water started to be transferred in the Attenuation Pond in November 2014 only. As there are no metals (or negligible concentration) in the surface runoff, the concentration of some parameters such as chromium and thallium weren't measured. As of 2015, more parameters were analysed for the different inputs entering the TSF and these measured values were considered in the water quality forecast model. This is the reason why some parameters, such as total chromium, can have a zero value in certain input streams, but still have a higher forecasted value at closure due to other inputs entering the system.*

*For the Portage Pit and Goose Pit, strontium and uranium are not currently monitored. Agnico will analyse these values starting in 2020 and these measurements will be integrated in the water quality forecast model. The zero values used as initial conditions in 2013/2014 will be replaced by the first available data in next year's water quality report. However, we do not expect these additional data to change the conclusions for these parameters.*

*The second category includes the Saddle Dam 1 Sump to North Cell 2015/2018, Saddle Dam 3 Sump to South Cell 2016/2018, East Dike Seepage to Portage Pit 2016/2018. Strontium and Uranium were not measure at these locations. Agnico will analyse these values starting in 2020 to better forecast water quality and these measurements will be integrated in the water quality forecast model. Regarding thallium, its values are generally below detection limit and are around 0.0008 mg/L. The values for thallium will be included in next year's water quality report. However, we do not expect these additional data to change the conclusions for these parameters.*

### 5.7 Mercury Monitoring Plan

**References:** Agnico Eagle Mines Limited. Meadowbank Gold Project 2018 Annual Report, Appendix 51: CREMP Addendum, Appendix A: Mercury Monitoring Plan for Whale Tail South Area, Version 2 (March 2019). April 2019

**Concern:** Section 3.1 (Surface Water & Depth Profiles) of the Mercury Monitoring Plan states that samples will primarily be collected as surface level grabs rather than at 3 m depth (which is the protocol for regular CREMP samples). The rationale provided for this sampling approach is that the CREMP baseline data indicates that lakes within the flood zone tend to be well mixed. A consultant's report (Azimuth 2016) is referenced, but the report and baseline monitoring data are not provided to support this conclusion.

According to Section 3.2 of the Mercury Monitoring Plan, grab samples targeting the top 3 – 5 cm will be collected annually, with sediment core samples collected at a minimum every three years. This section further states that consultation with Agnico's academic research partner at the University of Waterloo has indicated that grab samples collected in the manner described in





Azimuth (2015), Appendix B, are appropriate for analysis of mercury in sediment. However, the report referenced has not been provided to support this conclusion.

**Recommendation 7:** ECCC requests that the Proponent provide any associated monitoring data for the following consultant reports to support the proposed approaches of (1) collecting only surface level grabs, rather than monitoring vertical water quality and (2) collecting sediment grab samples, rather than annual core samples:

- Azimuth (Azimuth Consulting Group Partnership). 2016. Whale Tail Pit Core Receiving Environment Monitoring Program (CREMP) 2014-2015 Baseline Studies. Prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Vancouver, BC. January, 2016.
- Azimuth (Azimuth Consulting Group Partnership). 2015. Core Receiving Environment Program: 2015 Update. Prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Vancouver, BC. November, 2015.

**Agnico Eagle's Response:**

*Agnico has attached the requested reports in Appendix A and B.*

## **5.8 Possible Acid Rock Drainage/ Metal Leaching**

**References:** Agnico Eagle Mines Limited. Meadowbank Gold Project 2018 Annual Report, Section 3.1 Dikes and Dams. April 2019

**Concern:** In the Annual Report, the Proponent states the following:

“The Central Dike seepage is normally pumped back into the South Cell. From September to October 2017 the seepage was transferred to Goose Pit as a mitigation measure. This measure, combined with an adapted tailings deposition plan was effective in reducing the seepage flow rate. As a result, the average seepage rate at Central Dike decreased from 540 m<sup>3</sup>/h in 2017 to 263 m<sup>3</sup>/hr at the end of 2018 and is following the trend from the 2017 seepage modelling done by Golder.

In the summer of 2017 the water in the downstream pond became orange and this was associated with rapid temperature variation. This event was investigated by chemical analysis and was found to be caused by the precipitation of iron oxide from bacterial process. As predicted this event re-occurred in the summer of 2018.

The current mitigation strategy to reduce the risk related to seepage includes the following:

- increased surveillance frequency (instrumentation review, site observation)



- presence of a backup pumping unit in the downstream area to maintain enough pumping capacity in case of a sudden seepage increase
- revised tailings & water management strategy to minimise the amount of water stored into the South Cell while maximising tailings coverage against Central Dike and Saddle Dam 4” (Page 16)

ECCC notes that it is possible that the orange or rusty colour observed in the water downstream could be an evidence of the oxidation of iron sulphide thereby creating acid rock drainage/metal leaching (ARD/ML). Iron-oxidizing bacteria helps to accelerate the oxidation of iron in cases where they are present in the water. If this is the case, and has resulted in ARD/ML, it is not clear how the proposed mitigation strategy provided by the Proponent will reduce/prevent the amount of iron oxide or the iron-oxidizing bacterial process (thereby preventing the incidence of ARD/ML).

Additionally, the Proponent did not indicate whether the orange coloured water was tested for ARD or indicate the pH value of the water in order to confirm or eliminate ARD/ML activity.

**Recommendation 8:** ECCC recommends that the Proponent test the orange coloured water for ARD/ML and demonstrate how the proposed mitigation will reduce/prevent the incidence of the ARD/ML downstream if it is found to be occurring.

**Agnico Eagle’s Response:**

*Water was tested in 2017 and in 2018 and all parameter were confirming the hypothesis that the orange coloration was a bacterial process and not ARD/ML. No pH reduction was measured in the Central Dike seepage water. Testing of this water will resume at freshet in 2019 with a similar program to continue to confirm the hypothesis of a bacterial process.*

## **5.9 Long-tailed Duck Mortalities**

**References:** Agnico Eagle Mines Limited. Meadowbank Gold Project 2018 Annual Report, Table 12.6: Project Related Mortality (Waterbirds). April 2019; Agnico Eagle Mines Limited. Meadowbank Gold Project 2018 Annual Report, Appendix 45: Wildlife Monitoring Summary Report, Section 4.5.6 Wildlife Mortality. April 2019

**Concern:** Two Long-tailed ducks were found dead on separate occasions (September 17 and 20, 2018) near the Assay Lab and suspected to have collided with the building. The report indicates that “no actions” were taken.

There are several factors that may have contributed to these incidents including, poor weather and low visibility, lighting attraction, and presence of reflective surfaces or large windows.



Understanding whether any of these factors came into play could help prevent similar mortalities in the future at this specific location.

**Recommendation 9:** ECCC recommends that the Proponent:

- Report all migratory bird incidents and mortalities to: ec.dalfnord-wednorth.ec@canada.ca and ec.eenordrpnnu-eanorthpnrnu.ec@canada.ca.
- Provide an assessment of the various factors listed above to determine if any were factors in the September 17 and 20, 2018 mortalities.

**Agnico Eagle's Response:**

*Agnico acknowledges ECCC's comments and will provide report related to all migratory bird incidents and mortalities at the email address referenced in the recommendation.*

*Agnico has conducted an assessment of the various factors detailed above and determine that there is no apparent reasons for these two mortalities.*

#### **5.10 PRISM and Breeding Bird Monitoring Program**

**References:** Agnico Eagle Mines Limited. Meadowbank Gold Project 2018 Annual Report, Appendix 45: Wildlife Monitoring Summary Report, Section 14.4 Recommendations (Breeding Bird Monitoring). April 2019

**Concern:** Section 14.4 of Appendix 45 states that analysis of PRISM (Program for Regional and International Shorebird Monitoring) data in 2015 showed community indices were variable with little difference in overall trends between mine and control plots.

ECCC reviewed the 2015 analysis of the PRISM data and is of the view that more analysis of the data would be helpful to inform the future of this monitoring program and/or to support a change to the monitoring objective.

Section 14.4 also recommends that a North American Breeding Bird Survey Route (BBS) be established in 2019. ECCC generally supports this recommendation but has concerns with the proposed monitoring frequency in TEMP (i.e. every 3 years) and potential for observer variation. An alternative design may need to be considered to ensure that this work is a valuable contribution to the national monitoring program.

**Recommendation 10:** ECCC recommends that the Proponent:

- Contact ECCC at ec.eenordrpnnu-eanorthpnrnu.ec@canada.ca to discuss the future of the PRISM and BBS monitoring program.



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- Following discussions with ECCC complete additional analysis of the 2015 PRISM data to fully inform the future of the monitoring program and/or support a change to the monitoring objective.

**Agnico Eagle's Response:**

*Agnico welcomes further discussion on this and suggest it be addressed through the Terrestrial Advisory Group.*

### 5.11 Fish-out Waterbird Observations

**References:** Agnico Eagle Mines Limited. Meadowbank Gold Project 2018 Annual Report, Appendix 43: Whale Tail 2018 Fishout Report. April 2019

**Concern:** As part of the Fish-out Diving Waterbird Protection Plan, observations of diving waterbirds are to be collected to inform risks and placement of gill nets during the fish-out.

ECCC reviewed the Fish-Out Report and did not see a summary of the waterbird observations. A summary does not appear to be included in the 2018 Wildlife Monitoring Summary Report either.

**Recommendation 11:** ECCC recommends that the Proponent provide the waterbird observations associated with the Whale Tail fish-out and confirm that no by-catch incidents occurred

**Agnico Eagle's Response:**

*No waterbird were observed in the vicinity of the Whale Tail North Basin during the fishout, and thus, no by-catch incidents occurred.*

### 5.12 Marine Mammal and Seabird Observer Report

**References:** Agnico Eagle Mines Limited. Meadowbank Gold Project 2018 Annual Report Appendix 55: Marine mammal and seabirds observer (MMSO). April 2019; Environment and Climate Change Canada. Meliadine Gold Project 2018 Annual Report – Review Comments Submitted to the NIRB. May 2019; Gjerdrum, C., D.A. Fifield, and S.I. Wilhelm. 2012. Eastern Canada Seabirds at Sea (ECSAS) standardized protocol for pelagic seabird surveys from moving and stationary platforms. Canadian Wildlife Service Technical Report Series No. 515. Atlantic Region. vi + 37 pp

**Concern:** ECCC reviewed the MMSO Report and has concerns about the quality of the data provided. The surveys also do not appear to have follow established ECCC seabird survey protocols (Gjerdrum et al. 2012). This is consistent with ECCC's review of the Proponent's Meliadine Project MMSO report. ECCC has initiated discussions with Proponent to address these concerns.



**Recommendation 12:** ECCC recommends that the Proponent provide staff with adequate training to implement established ECCC seabird survey protocols

**Agnico Eagle's Response:**

*Agnico Eagle contacted in 2019 ECCC to discuss the implementation of the ECCC seabird survey protocols and to look into the possibility to have ECCC to provide direction and/or training before the 2019 season. ECCC have provided to Agnico a presentation that was given in the past to some observers industry. In this presentation, there is a component on bird identification and instruction for the protocol. ECCC also refer us to the company Edgewise for a formal training beyond 2019.*

*For the 2019 season, a poster was created to improve bird identification and the presentation provided by ECCC was forwarded to our shipping company, which was used to increase the effectiveness of the bird survey. Agnico Eagle will also investigate with the shipping company the possibility of formal training in the future. This training can be held by Edgewise or other qualify company.*

## **6 Transport Canada (TC)**

### **6.1 Baker Lake Fuel Farm Expansion Project**

**References:** Annual Report section 11.2.3 Agnico Eagle Mines Limited. Meadowbank Gold Project

**Concern:** As a result of ore hauling from the Approved Whale Tail Pit Project to Meadowbank, and the addition of a Power Plant and heating facilities at the Whale Tail site, diesel fuel needs have increased and calculations made prior to the Approval Project permitting process underestimated the requirements of fuel. To address the upcoming shortage, Agnico Eagle is proposing to add two (2) 10 million L diesel fuel storage tanks to the Marshalling Area Bulk Fuel Storage Facility in Baker Lake for a total of 80 million litres. Proposed infrastructures would be built starting in April 2019 pending all regulatory approvals have been received by then.

**Recommendation 1:** If Agnico Eagle mines expands their Oil Handling Facility at Meadowbank, their Oil Pollution Emergency Plan would need to be update to reflect the changes in the facility's characteristics.

**Agnico Eagle's Response:**

*The OPEP will be update to reflect changes at the Baker Lake Oil Handling Facility. The updated management plan will be submitted to Transport Canada Inspector once completed and include in the 2019 Annual Report.*