



August 4th, 2022

Emily Koide
Technical Advisor I
Nunavut Impact Review Board

Re: Agnico Eagle's response to Meadowbank (03MN107) and Whale Tail (16MN056) 2021 Annual Report comments

Dear Ms. Koide,

The following information are intended to address regulator's comments regarding the Meadowbank (03MN107) and Whale Tail (16MN056) 2021 Annual Report:

- Government of Nunavut – June 30, 2022: Comment Request for Agnico Eagle Mine's Meadowbank and Whale Tail Project 2021 Annual Report
- Fisheries and Oceans Canada – June 30, 2022: 03MN107 & 16MN056 – Agnico Eagle – Meadowbank Gold Mine and Whale Tail Pit Projects (Meadowbank Complex) – 2021 Annual Monitoring Report
- Crown-Indigenous Relations and Northern Affairs Canada – June 30, 2022: Comment Request for Agnico Eagle Mines Limited's Meadowbank Complex 2021 Annual Report
- Kivalliq Inuit Association – June 30, 2022: Review of Agnico Eagle Mines Limited's Meadowbank Complex 2021 Annual Report; NIRB File No.: 03MN107 & 16MN056
- Environment and Climate Change Canada – June 30, 2022: 03MN107 / 16MN056 – Agnico Eagle Mines Ltd. – Meadowbank Gold Mine and Whale Tail Pit Projects – 2021 Annual Report
- Transport Canada – June 29, 2022: Transport Canada's comments for Agnico Eagle Mine Limited's Meadowbank Complex 2021 Annual Report

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



Regards,

Agnico Eagle Mines Limited – Meadowbank Complex

A handwritten signature in black ink, appearing to read "Alexandre Lavallee". The signature is fluid and cursive, with a long horizontal stroke at the end.

Alexandre Lavallee

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Environment & Critical Infrastructures Superintendent



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1 Government of Nunavut (GN)

1.1 Helicopter Traffic Monitoring and Reporting

Term and Condition: 61 and 62(f) (NIRB Project Certificate No. 004), and 28 (NIRB Project Certificate No. 008)

References: Agnico Eagle Mines (AEM) Ltd. (2019). Meadowbank Division Terrestrial Ecosystem Management Plan, Version 7. Agnico Eagle Mines (AEM) Limited. (2021). Meadowbank Complex 2020 Annual Report, Appendix 47 – Meadowbank and Whale Tail 2020 Wildlife Monitoring Summary Report. Agnico Eagle Mines (AEM) Limited. (2022). Meadowbank Complex 2021 Annual Report, Appendix 47 – Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report. Environmental Dynamics Inc (EDI). (2022). Mary River Project Terrestrial Environment 2021 Annual Monitoring Report. Government of Nunavut (GN). (2021). Government of Nunavut comments on the 2020 Meadowbank and Whale Tail Project Annual Report. Government of Nunavut (GN). (2017). Final Written Submission for Agnico Eagle Mines' Environmental Impact Statement for the proposed Whale Tail Pit Project. Nunavut Impact Review Board (NIRB). (2017) Final Hearing Report, Agnico Eagle Mines Ltd. Whale Tail Project. NIRB File No. 16MN056. Nunavut Impact Review Board (NIRB). (2006) Project Certificate for the Meadowbank Gold Mine Project. Project Certificate 004. Nunavut Impact Review Board (NIRB). (2020). 2019-2020 Annual Monitoring Report Meadowbank Gold Mine and Whale Tail Pit Projects. Nunavut Impact Review Board (NIRB). (2021). 2020-2021 Annual Monitoring Report Meadowbank Gold Mine and Whale Tail Pit Projects.

Identification of issue: Helicopters are a potential source of disturbance for caribou and other wildlife. In the Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report (AEM 2022), the Proponent has made significant improvements in the monitoring and reporting of Project-related helicopter traffic.

However, the GN notes that a majority of reported flights in 2020 and 2021 were below the minimum flight altitudes set in the Project's Terrestrial Ecosystem Management Plan (TEMP) and in Terms and Conditions 61 and 62(f) of Project Certificate No. 004 (NIRB 2006). This includes flights during caribou migration periods. The GN is concerned about the potential impacts of this low-level flying on wildlife and requests that the Proponent provide additional information to demonstrate whether low-level flights were justified or whether there is a compliance issue.

Importance to review and supporting rationale: NIRB Project Certificate No. 004 Terms and Conditions 61 and 62(f) state that:

"61. In consultation with EC, Cumberland shall incorporate into the Terrestrial Ecosystem Management Plan and the Air Traffic Management Plan a commitment for aircraft to maintain (whenever possible) a cruising altitude of at least 610 metres during point to point travel when in areas likely to have migratory birds, and 1000 metres vertical and 1500 metres horizontal distance



from observed concentrations of migratory birds, and use flight corridors to avoid areas of significant wildlife importance.”

and

“62. Cumberland shall develop and implement a noise abatement plan to protect people and wildlife from significant mine activity noise, including blasting, drilling, equipment, vehicles and aircraft. The noise abatement plan will be developed in consultation with Elders, GN, HC, and EC and include:

f) Require (with the exception of take off and approach for landing), a minimum flight altitude of 610 metres above ground when flights to and from the mine site are passing sensitive wildlife and bird areas.”

(NIRB 2006)

Additionally, the Project’s Terrestrial Ecosystem Management Plan (TEMP, AEM 2019) includes the following restrictions for helicopters:

- (1) That long-range flights are a minimum of 650 m above ground level, except for take-off and landing;
- (2) Short-range flights are a minimum of 300 m above ground level, except for take-off and landings;
- (3) Caribou groups of 50 or more animals, and muskoxen of 10 or more animals must be avoided by a minimum of 1,000 m vertically and 1,500 m horizontally;
- (4) Flocks of migratory birds must be avoided by 1,100 m vertically and 1,500 m horizontally; and
- (5) Harassing wildlife (flying below 300 m) is expressly forbidden unless animals pose an immediate danger to humans.

During the NIRB’s Review of the Whale Tail Project, the GN noted concerns about the potential for helicopters to disturb wildlife such as caribou (GN 2017, Comment GN-10). Similar concerns were expressed by community members from Baker Lake (e.g., Whale Tail Final Hearing Transcripts, 2019, page 561)

In response to these concerns, the Proponent made a commitment to the Government of Nunavut (GN) that:

“The Proponent shall revise the Project’s TEMP to include a program to monitor and report helicopter traffic associated with the Whale Tail project (including existing Meadowbank infrastructure) and all associated exploration activities so that the spatial scale and intensity of



this activity can be documented. This should include the collection and analysis of GPS track logs for all helicopter flights contracted by the Proponent.”

(NIRB 2017, Appendix B, Commitment #20).

This commitment was not fulfilled during the 2018 and 2019 reporting years, as evidenced by the absence of relevant revisions to the TEMP and lack of information regarding helicopter traffic in the Proponent’s 2018 and 2019 Annual Reports. In 2020, the NIRB directed the Proponent to work with the GN and Terrestrial Advisory Group (TAG) to revise the TEMP to incorporate the requirements of this commitment (NIRB 2020). In the 2020 Wildlife Monitoring and Summary Report (AEM 2021), the Proponent provided information on helicopter traffic. However, as noted by the GN (GN 2021), the limited scope and format of this information was not consistent with the commitment made to the GN and did not reflect input provided by the GN or other members of the TAG. In 2021, the NIRB again noted:

“Further, the NIRB is concerned that helicopter traffic is not being monitored as required and that helicopter traffic is going undocumented, leading to party’s inability to verify the Proponent’s assertion of infrequent helicopter traffic or determine if any potential impacts to wildlife are occurring. Therefore, Agnico Eagle should work with the GN and the TAG as per Terms and Conditions 27 and 28 of the Whale Tail Project Certificate No. 008 to revise its Terrestrial Ecosystem Management Plan to incorporate the requirements of Commitment # 20.”

(NIRB 2021)

In the Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report (AEM 2022), the Proponent has significantly improved reporting of helicopter traffic in line with commitment # 20. In 2021, there were 141 days during which helicopters flew for a total of 1,382 hours, with most flights occurring during the summer (AEM 2022, tables 29). However, the GN notes with concern that most of this flight time, including flights during spring and fall caribou migration periods, occurred below the 300 m altitude threshold set in the TEMP; the lowest of all the altitude thresholds in the TEMP and the Projects’ Certificates. Reported flights for 2020 were similarly mostly below the 300 m threshold (AEM 2022, table 28).

The 300 m altitude threshold is the lowest altitude limit in TEMP and both Project Certificates and is considered the absolute minimum necessary to avoid harassment of wildlife. The report provides a brief discussion to justify why some flights occurred below 300 m stating that:

“Some flights for environmental monitoring require lower altitudes, including flights to visually inspect water quality of the water bodies around bridges and roads, inspection of various mine infrastructure for runoffs, lake water sampling, and raptor surveys. Meteorological conditions and visibility may limit flight altitudes.”



(AEM 2022, section 4.5.9)

However, the report does not provide information on how many flights occurred below 300 m in 2021 based on these justifications. The GN is concerned about the potential impacts of this low-level flying on wildlife and seeks to determine what proportion of such flights are essential for fulfilling Project regulatory obligations, are justifiable for safety purposes, or reflect poor pilot compliance with the TEMP and Project Terms and Conditions.

The GN also notes the Proponent's suggestion in the 2019 Wildlife Monitoring Summary Report that 3 days of helicopter traffic associated with the deployment of caribou satellite collars in the spring of 2018 may have affected the migration of caribou through the Project's regional study area (AEM 2020b, Section 17). Although unsubstantiated by evidence, if the Proponent is concerned about 3 days of helicopter flights affecting caribou migration, the GN questions why the Proponent does not express greater concern about the potential impacts of the hundreds of hours of Project-related low-level flying that occurred over 141 days in 2021. The report does not conduct an analysis to determine if there is a compliance problem or provide recommendations for adaptive management.

Other Projects in Nunavut report helicopter traffic in a manner that allows parties to monitor compliance with flight altitude thresholds established to mitigate impacts on wildlife. For example, reporting of the Mary River Project includes a detailed break-down of the proportion of flights occurring below altitude thresholds that occurred with or without justifiable reason (EDI 2022). The same format of reporting should be implemented by the Proponent.

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

That in future Annual Reports the Proponent report helicopter flights in the same format as presented by Baffinland Iron Mines Ltd. in its 2021 Terrestrial Environment 2021 Annual Monitoring Report for the Mary River Project. This should include a breakdown of the proportion of flights and hours of flying occurring below altitude threshold; separating flights that had a justifiable reason for low-level flying (and noting the reason) versus flights that did not have justification.

Agnico Eagle's Response: *Agnico Eagle's understanding from Environmental Dynamics Inc. is that the 2021 annual monitoring report (referenced as EDI 2022 by the GN) for Baffinland Iron Mine is not publicly available at this time. When this report is available Agnico Eagle will review it as to whether a similar assessment can be completed. Note that because it is already July of 2022, it will not be possible to provide the requested information for the entire 2022 monitoring year.*

Agnico Eagle disagrees with the GN that helicopter use by Agnico Eagle would cause similar disturbance to caribou as helicopters used by the GN for collar deployment by net-gunning. Net-



gunning includes a low-level helicopter chasing an individual caribou at close range and trapping the caribou with a net fired from a gun. If captured, the animal is physically restrained by participants (and possibly anaesthetized) while a telemetry collar is fixed around the caribou's neck. Biological samples may be taken at this time by needle or other means. The collared caribou is then released. If the net-gun misses, the chase is either continued on the same caribou or new caribou is located for capture.

Individual caribou targeted for collar deployment are located by telemetry of caribou collared during previous years by helicopter. It is reasonable to expect that a previously collared animal might relate the chase and capture experience to the noise or visual cues of a helicopter and respond adversely. Agnico Eagle believes this is a much different experience for the caribou than a helicopter used for mining and exploration, which does not involve chasing or capturing caribou. Several scientific studies show that collaring of animals alters behaviour for up to the first two weeks post-collar deployment (Morellett et al. 2009; Neuman et al. 2011; Dechen Quinn et al. 2012; Northrup et al. 2014; Becciolini et al. 2018). These studies also recommend censoring data immediately following deployment to eliminate adverse behaviour from being included in analyses.

References

Becciolini V, Lanini F, Ponzetta MP. 2019. Impact of capture and chemical immobilization on the spatial behaviour of red deer Cervus elaphus hinds. Wildlife Biology, doi: 10.1111/2981/wlb.00499.

Dechen Quinn AC, Williams DM, Porter WF. 2012. Postcapture movement rates can inform data-censoring protocols for GPS-collared animals. Journal of Mammalogy 93:456-463.

Morellett N, Verheyden H, Angibault JM, Cargnelutti B, Lourtet B, Hewison MAJ. 2009. The effect of capture on ranging behaviour and activity of the European roe deer Capreolus capreolus. Wildlife Biology 15:278–287.

Neumann W, Ericsson G, Dettki H, Arnemo JM. 2011. Effect of immobilizations on the activity and space use of female moose (Alces alces). Canadian Journal of Zoology 89:1013-1018.

Northrup JM, Anderson CA JR. Wittemyer, G. 2014. Effects of helicopter capture and handling on movement behavior of mule deer. Journal of Wildlife Management 78:731-738.

Northrup JM, Anderson CA JR. Wittemyer, G. 2014. Effects of helicopter capture and handling on movement behavior of mule deer. Journal of Wildlife Management 78:731-738



1.2 Blast Monitoring Study

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

References: Agnico Eagle Mines (AEM) Ltd. (2019). Meadowbank Division Terrestrial Ecosystem Management Plan, Version 7. Agnico Eagle Mines (AEM) Limited. (2022). Meadowbank Complex 2021 Annual Report, Appendix 47 – Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report.

Identification of issue: As part of the Project's Terrestrial Ecosystem Management Plan (TEMP), the Proponent is conducting a Blast Monitoring Study to measure vibration levels and over pressures at varying distances from blast sites. One of the objectives of the Study is to estimate the distances over which vibration and noise may be perceptible to wildlife such as caribou and muskoxen.

In the Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report (AEM 2022), the Proponent concludes there are no seasonal differences in the way blast over-pressure propagates in the environment. However, the information presented appears to suggest there are seasonal differences. This has importance for informing season-specific blasting mitigation measures such as those contained in the TEMP to reduce disturbance of wildlife.

Importance to review and supporting rationale: The 2021 Annual Report states that:

"Figure 23 presents a PPL [Peak Pressure Level] versus distance curve estimated based on all blast measurements alongside PPL versus distance curves estimated based on the seasonal breakdown. The curves in Figure 23 do not suggest a seasonal difference in the way PPL propagates into the environment."

(AEM 2022, section 9.5)

It is unclear whether this conclusion of 'no seasonal difference' is based on a statistical analysis or a subjective review of the curves presented in figure 23. If based on the latter, an alternative conclusion can be reached. For example, visual inspection of figure 23, indicates the Peak Pressure Level (PPL), which characterizes air-blast overpressure, reaches 115 decibels (dB, a published human annoyance threshold cited in the Report) at 0.75 km and 1.5 km during winter and spring blast, respectively. If true, this suggests that sound, at levels known to be annoying to people, propagates twice as far in spring compared to winter. This has important implications for informing blasting distance buffers to mitigate disturbance of wildlife such as spring migrating caribou.

The apparent seasonal difference in propagation of blast over-pressure should be further investigated with adequate sample sizes and appropriate statistical analyses.

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



1. That Proponent clarify whether the conclusion that blasting over-pressure shows no seasonal difference in propagation distance is based on statistical significance. If based on a statistic analysis, please provide the details of the analysis.

Agnico Eagle's Response: *Figure 23 of the 2021 Annual Report presents a PPL vs. distance curve established through application of regression analysis to all 174 PPL measurements collected between December 20, 2020 and August 6, 2021. Figure 23 also presents the 95% confidence interval for the "all blasts" curve (i.e., the range within which one can be 95% confident that the true relationship between PPL and distance will fall). In addition, Figure 23 presents separate PPL vs. distance curves established through application of regression analysis to the 49 PPL measurements collected during the spring period, the 42 PPL measurements collected during the summer period, the 11 PPL measurements collected during the fall period, and the 72 PPL measurements collected during the winter period.*

For very small propagation distances (i.e., <100 m), the spring curve is located above the 95% confidence interval established for the "all blasts" curve. However, for propagation distances greater than 100 m, the seasonal curves all lie within the 95% confidence interval established for the "all blasts" curve. Based on this result, it is not possible to identify a statistically significant difference in the way that PPL propagates into the environment. In other words, as noted in the 2021 report, the data collected to date does not suggest a seasonal difference in the way PPL propagates into the environment at distances greater than 100 m. The current blast suspension threshold is 4 km during sensitive seasons when the GST is exceeded (Agnico Eagle 2019), except during calving when the threshold is 5 km. These thresholds are not based on caribou behaviour data in response to blasting. At these thresholds there is no seasonal difference in PPL based on 95% confidence interval overlap.

Please note that 95% confidence intervals were also calculated for the individual seasonal curves but, in the interest of clarity, these confidence intervals were not plotted in Figure 23 of the 2021 report. Exceedance outside of the 95% confidence interval would indicate statistical significance (Nakagawa and Cuthill 2007). In response to GN's specific concern about propagation of PPL during the spring and winter periods, Figure 1.2-1 presents PPL vs. distances curves established through application of regression analysis to the 49 PPL measurements collected during the spring period and the 72 PPL measurements collected during the winter period, along with 95% confidence intervals for each curve.

For very small propagation distances (i.e., <100 m), the spring curve is located above the 95% confidence interval established for the winter curve and the winter curve is located below the 95% confidence interval established for the spring curve. However, for propagation distances greater



than 100 m, the spring curve lies within the 95% confidence interval established for the winter period and the winter curve lies within the 95% confidence interval established for the spring period. This result supports the observation that it is not currently possible to identify a statistically significant difference in the way that PPL propagates into the environment.

The observation that data collected to date does not suggest a seasonal difference in the way PPL propagates into the environment does not rule out the possibility of a seasonal difference; however, the present analysis could not identify such a relationship based on the data that is currently available. A statistically significant seasonal difference may emerge with the collection and analysis of more data. As noted below, Agnico Eagle intends to continue to record blast location, charge mass and depth and will continue to analyze this data to establish relationships between PPL, propagation distance, and caribou response.

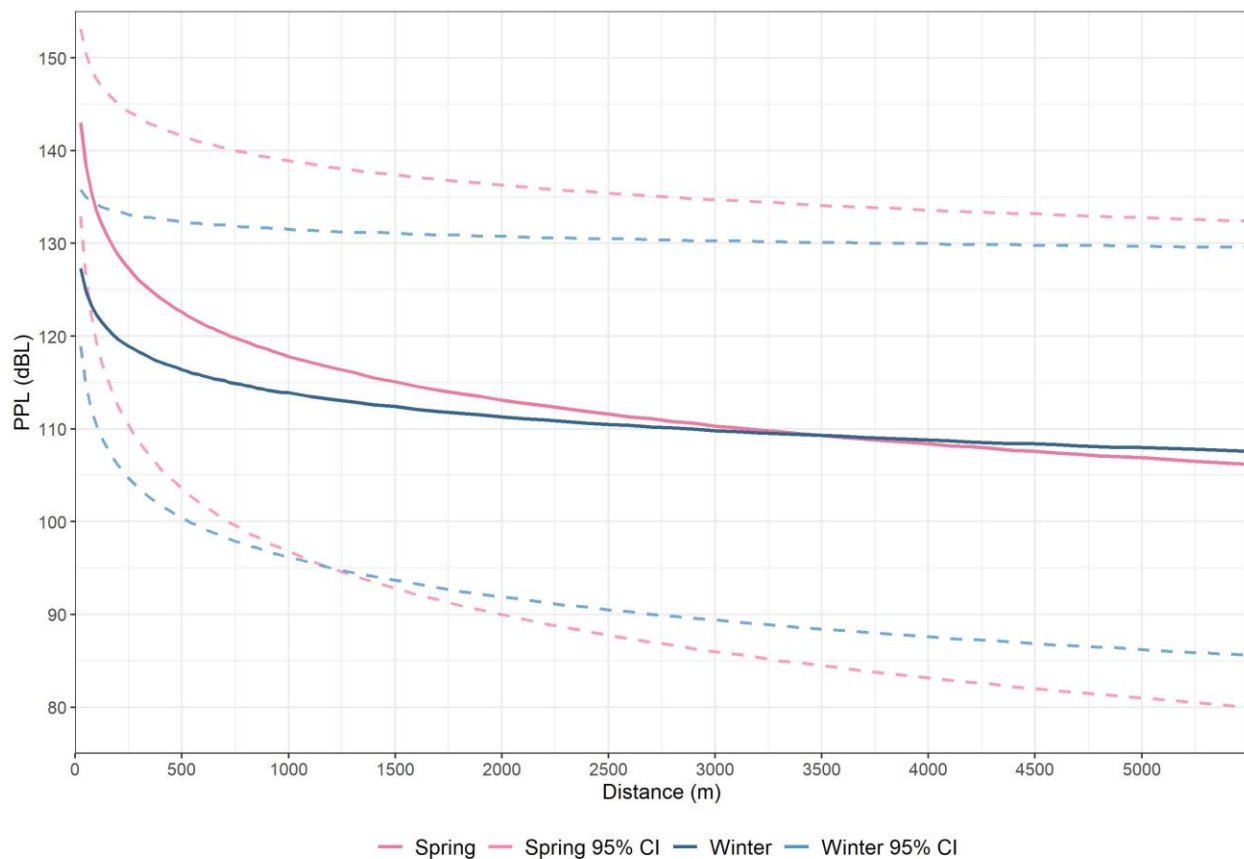


Figure 1.2-1: Airblast overpressure versus distance for spring and winter seasons. Dashed lines represent 95% confidence intervals.



For mitigation design purposes the over-pressure level that leads to a response by caribou is much more informative than the presence of a statistical seasonal effect of PPL propagation.

References

Agnico Eagle. 2019. Terrestrial Ecosystem Management Plan, Meadowbank Division. Version 7. June 2019.

Nakagawa S, Cuthill IC. 2007. Effect size, confidence interval and statistical significance: a practical guide for biologists. Biological Reviews 82:591-605.

2. That the Proponent clarify how over-pressure propagation will be further investigated to establish adequate statistical power to detect potential seasonal differences that would inform blasting mitigation for wildlife.

Agnico Eagle's Response: *Agnico Eagle will continue to monitor blast parameters (blasting charge, depth, coordinates) and caribou behaviour opportunistically to evaluate whether caribou respond to over-pressure (and blast vibration) and determine appropriate mitigation thresholds (e.g., distance buffer).*

1.3 Road Closures for Migrating Caribou

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

References: Agnico Eagle Mines (AEM) Ltd. (2019a). Meadowbank Division Terrestrial Ecosystem Management Plan, Version 7. Agnico Eagle Mines (AEM) Ltd. (2019b). Submission to NIRB. Final Written Statement Responses Whale Tail Pit – Expansion Project. Agnico Eagle Mines (AEM) Ltd. (2019c). Technical Comment Responses Whale Tail Pit – Expansion Project. Submitted to the Nunavut Impact Review Board. Agnico Eagle Mines (AEM) Limited. (2022). Meadowbank Complex 2021 Annual Report, Appendix 47 – Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report. Berger, J. et al. (2008). Protecting migration corridors: challenges and optimism for Mongolian saiga. PLoS Biology 6(7):e165. doi: 10.1371/journal.pbio.0060165 PMID: 18666827. Berger, J. (2004). The last mile: how to sustain long-distance migration in mammals. Conservation Biology 2004; 18(2):320–31. Boulanger, J., R. Kite, M. Campbell, J. Shaw and D.S. Lee. (2020). Analysis of Caribou Movements Relative to the Meadowbank Mine and Roads During Spring Migration. Government of Nunavut, Department of Environment, Technical Report Series – No:01-2020. 31 July 2020. Bolger, D. et al. (2008). The need for integrative approaches to understand and conserve migratory ungulates. Ecology Letters (2008) 11: 63-77. doi: 10.1111/j.1461-0248.2007.01109.x Committee on the Status of Endangered Wildlife in Canada (COSEWIC). (2016). COSEWIC assessment and status report on the Caribou Rangifer tarandus, Barren-ground population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xiii + 123 pp.



(<http://www.registrelep-sararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1>). Government of Nunavut (GN). (2019). Government of Nunavut comments on the 2018 Meadowbank and Whale Tail Project Annual Report. Government of Nunavut (GN). (2020). Government of Nunavut comments on the 2019 Meadowbank and Whale Tail Project Annual Report. Government of Nunavut (GN). (2021). Government of Nunavut comments on the 2020 Meadowbank and Whale Tail Project Annual Report. Nicholson et al. (2016). Modeling Caribou Movements: Seasonal Ranges and Migration Routes of the Central Arctic Herd. PLoS ONE 11: e0150333.doi: 10.1371/journal.pone.0150333 Nunavut Impact Review Board (NIRB). (2019). Nunavut Impact Review Board 2018 – 2019 Annual Monitoring Report for Agnico Eagle Mines Ltd.'s Meadowbank Gold Project [03MN107] & Whale Tail Pit Project [16MN056]]. Wilcove DS, Wikelski M. (2008). Going, going, gone: is animal migration disappearing. PLoS Biology. 2008; 6(7):e188. doi:10.1371/journal.pbio.0060188 PMID: 18666834

Identification of issue: During the NIRB's Review of the Whale Tail Pit Project and the Whale Tail Expansion Project (collectively referred to here as the 'Project'), a key concern of parties was the potential for traffic on the Project's roads to disrupt the migration of caribou herds. In response to these concerns, the Proponent adopted a set of caribou protection measures to mitigate potential effects on caribou. These are presented in the Project's Terrestrial Ecosystem Management Plan (TEMP) as a series of caribou decision trees which prescribe specific mitigation measures that will be implemented when caribou are in the vicinity of the Project (AEM 2019a, figures 6-9). A key component of these decision trees is the requirement to automatically close the Project's Whale Tail haul road (HR) or All-weather-access-road (AWAR) to all traffic when caribou above a specific group size threshold (GST) are observed within 1.5 km of a road during either the spring or fall migrations; defined as April 1-May 25th and September 16-December 7th.

The commitment to automatically close Project roads during migration periods is a cornerstone of the Project's caribou protection measures and was a key piece of evidence, presented by the Proponent to the parties and NIRB during hearings on the Project, to provide assurances that impacts of caribou would be mitigated. At various times during the NIRB's proceedings, the Proponent has reiterated its commitment to these caribou protection measures in response to concerns expressed by the GN and other parties that they may not be, or were not being, properly implemented. For example:

"Agnico Eagle assures all parties that it will fully and consistently implement Caribou Protection Measures (CPMs) specified in the TEMP (Version 7, figure 6 to 9) in response to all observations of caribou, and will provide confirmation of this implementation in its Annual Reports." [emphasis added by reviewer]

(AEM 2019b, response to GN Final Written Submission)



In the Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report (AEM 2022), the Proponent claims that the caribou decision trees were implemented throughout 2021 according to the TEMP. This led to the full closure of the HR on 12 days during the spring migration and closure of the AWAR on 27- and 21-days during spring and fall migrations, respectively.

The GN disputes the Proponent's claim that the decision trees were implemented properly in 2021. A review of the data provided by the Proponent in the Annual Report shows there were numerous days during the spring and fall migrations when Project roads should have been automatically closed to allow passage of caribou but were not (see table 1 below). The GN is also concerned that the Proponent used alternative traffic management measures, such as partial closures or speed restrictions during periods when roads should have been automatically and fully closed. Finally, the Annual Report does not provide information on how long roads remained closed on specific days and what factors (information, consultations, etc.) led to reopening of the roads.

This is the fourth consecutive Annual Report (covering the Project's entire life to date) for which the GN has expressed concerns about noncompliance with the Project Certificate due to incomplete/inconsistent application of the TEMP's caribou decision trees (GN 2019, 2020, 2021). These caribou protection measures were submitted as evidence by the Proponent during NIRB's Review of the Project and were integral to intervenors' reviews of the Project's Final Environmental Impact Statement (FEIS). Failure to implement them fully constitutes a breach of trust and undermines the integrity of the environmental assessment process in Nunavut. The GN notes that the NIRB has previously directed the Proponent to properly implement the caribou decision trees, stating for example that:

"..... [T]he Proponent should ensure that road closures as a mitigation measure are being applied according to thresholds established in the TEMP and the definitions of essential and non-essential traffic. This information should be included in the 2019 Annual Report."

(NIRB 2019)

The GN feels that the Proponent is non-compliant with term and condition 28 of the Project Certificate (008) by not fully and consistently implementing the TEMP. The GN urges the NIRB to take immediate action to enforce term and condition 28 of the Project Certificate with respect to these matters. There is growing evidence that migrating caribou are being disrupted by the Project' roads and that the automatic road closures required under the TEMP are able to mitigate this disruption.

Importance to review and supporting rationale: The Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report (AEM 2022) states that:

"The decision trees were used throughout 2021." (Section 2.5)



And

"Road-related monitoring and mitigation were implemented according to Figures 7 and 8 of the TEMP version 7 (Agnico Eagle 2019)." (Section 3.6.5)

The GN disputes these conclusions on several counts as follows:

- 1) In reviewing the road survey data on caribou observations provided in Appendix A of the Report, it is apparent that there were numerous days during the spring caribou migration when either Whale Tail Haul Road (HR) or the AWAR should have been automatically closed but was not (Table 1 below). On these days, totalling 8 and 8 for the HR and AWAR, respectively, caribou above the group size threshold were observed within 1.5 km of a road. Instead of implementing the automatic road closure required under the TEMP's caribou decision trees, the Proponent's response was to implement a "speed restriction" (AEM 2022, appendix A) on these days; a measure that is not part of the prescribed response in the decision trees. During the fall migration, there were 3 days when roads should have been automatically closed but were not (2 for the AWAR and 1 for the HR).
- 2) For days in 2021 when Project roads were closed for migrating caribou, the report does not provide enough information for reviewers to assess whether closures were managed according to the requirements of the caribou decision trees. For example, the decision trees indicate that upon closure of a road, the Proponent will "[C]onsult daily with KivIA, GN and HTO to discuss options to re-open roads" (AEM 2019a, figure 7 and 8). The report does not provide information on the duration of closures, nor does it provide information on the consultations that took place amongst the KivIA, GN and HTO that led to reopening. It is unclear, whether the road closure days presented in table 9 of the report represent 24 hr closures or shorter periods. The duration of closure and the factors that led to each reopening must be provided in annual reports in-order for reviewers to assess compliance with the TEMP. In this regard, the GN notes a commitment made by the Proponent during the NIRB's review of the Whale Tail Expansion Project, to provide this type of information (AEM 2019c – Response to GN TRC #4).



Table 1. Days in 2021 when caribou, above Group Size Thresholds (GST) in the TEMP (AEM 2019a), were observed within 1.5 km of Project roads and should have triggered automatic road closure. (Source data: AEM 2022, Appendix A)

Road	Date(s) When Caribou Above GST Observed Within 1.5 km of Road	Road Status
AWAR	April 1	Open
	April 12 and 13	Speed restrictions
	May 7 to 17	Speed restrictions
Whale Tail Haul Road	April 13	Speed restrictions
	April 16	Speed restrictions
	April 17	Speed restrictions
	April 23	Speed restrictions
	April 25	Speed restrictions
	May 6 and 7	Speed restrictions
	May 21	Speed restrictions

There is a growing body of evidence that the migration of regional caribou herds is being disrupted by the Project's roads and that road closures are an effective means of mitigating this impact. For example:

- a) Road survey data for the Project show that a vast majority of migrating caribou are observed on the side of a road facing the on-coming migration. This suggests that caribou movements are being blocked the road and/or its traffic and consequently caribou are concentrating near the road as they attempt to cross it. An example of this is shown in figure 1 using the Proponent's 2019 road survey data for the Whale Tail Haul Road (HR) and AWAR. A similar pattern of caribou distribution is seen in all years for which data are available.

Figure 1. Frequency of caribou observations, made during road surveys, on the east and west sides of the Whale Tail haul road (1a) and All-Weather-Access-Road (1b) during the spring migration. Similar data presented for the Whale Tail haul road (1c) and AWAR (1d) for the fall migration. (Data derived from AEM 2020, Appendices A and B)

Figure 1a.

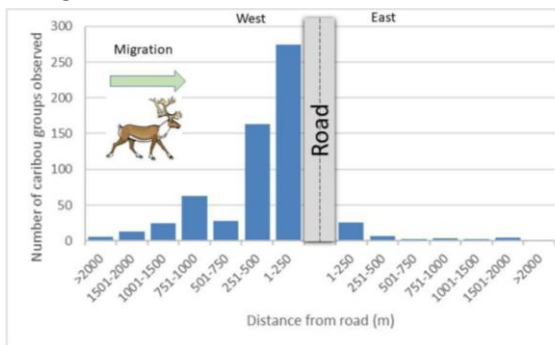


Figure 1b.

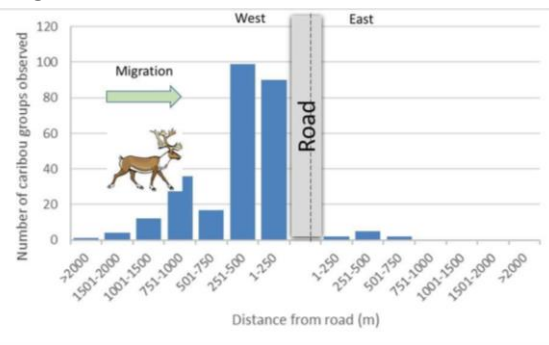


Figure 1c.

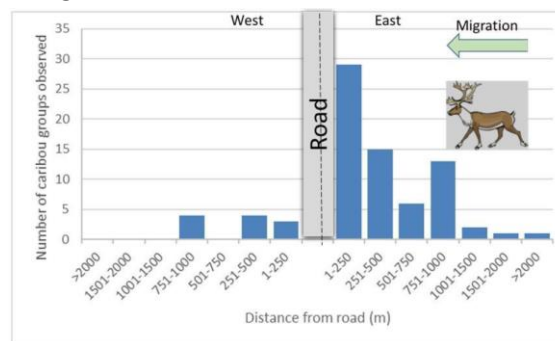
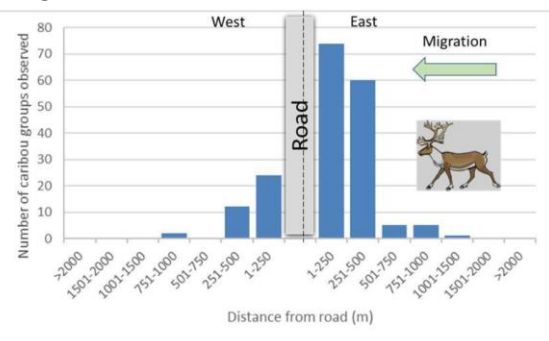


Figure 1d.



(b) In a study of spring migration patterns between 2011 and 2019, Boulanger et al. (2020) found that between 14 and 55% of collared caribou were deflected (i.e., did not cross) by the Project's roads during their migration. Caribou that crossed roads were delayed in crossing and the probability of crossing was significantly higher when a road was closed.

(c) Results from the Proponent's remote trigger camera study found that 12 of the 13 caribou road crossing events detected so far have occurred when the Whale Tail Haul Road was closed to traffic (AEM 2022).

(d) Examining caribou road crossing events recorded during road surveys conducted by the Proponent in 2021, shows that caribou were approximately 4 times more likely to be seen crossing roads when they were closed (See GN 2021 AR comment – Remote Camera Study).



Given this growing body of evidence regarding impacts of the Project's roads on caribou migration, the need to strictly enforce road closure requirements under the Project's TEMP is emphasised. The disruption of migratory routes by human activity is a recognized threat to barren-ground caribou in Canada (COSEWIC, 2016). As noted by Nicholson et al. (2016) in a study of caribou migration routes:

"Natural selection has likely favored caribou that follow migration routes that proved successful during previous years. In such cases, young caribou may learn by following older, experienced animals. Such reliance on traditional migration routes might delay or reduce the ability of caribou to adapt to environmental changes... Restoring migration routes after they have been disturbed or fragmented is challenging."

As such, if the Project results in the disruption of caribou migratory movements, the restoration of migration behavior may be delayed beyond the life of the Project or may not be restored. This could have significant consequences for the status of affected herds. For example, in reviewing two centuries of historical data on migratory ungulate species across the world, Bolger et al. (2008) found that in many cases the disruption of migration routes by human activities resulted in rapid population collapse. This, and other research findings, highlights the importance of maintaining connectivity in caribou range (Berger, 2004; Berger et al., 2008; Wilcove and Wikelski, 2008).

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

1. That the Proponent explain why Project roads were not automatically closed to traffic on the dates listed in table 1 above, as prescribed under the caribou decision trees.

Agnico Eagle's Response: *Agnico Eagle does not agree with the GN that there is a growing body of evidence that the migration of regional caribou herds is being disrupted by the Mine and roads. Agnico Eagle has demonstrated that collared female caribou encountering the Mine and roads during spring migration reach calving areas and at similar timing as collared caribou that do not encounter roads (i.e., reference caribou) (Golder 2020). As well, Golder (2020) showed that collared females encountering the Mine and roads did not have lower calving rates or higher neonate mortality rates as reference caribou. These findings are consistent with Plante et al. (2020), who found no measurable increase in mortality risk for collared Leaf River and George River caribou that interacted with industrial developments. These lines of evidence measuring caribou demography support that local residual changes to migration from developments are within the resilience limits of caribou.*

In response to point A above that road survey data for the Project show that a vast majority of migrating caribou are observed on the side of a road facing the on-coming migration, this observation is due to the monitoring approach targeting migrating groups as they approach the



road. Therefore, observations for the on-coming migrations side of the road will be biased high, and once a group or caribou is observed and counted, they are not counted after crossing. Further, the probability of detection increases as distance to the observers decreases, so the number of detections should be higher closer to the road. The distributions presented in Figure 1 are in line with expected observations for road surveys given the methodology and purpose of the program. Natural factors, such as habitat and topography, that may also be correlated with distance and explain the observed patterns but are not considered. Interpreting these distributions as caribou being blocked from crossing and/or concentrating on the on-coming migration side of the road are not supported by these data.

In response to point C and D above concerning caribou crossing roads more frequently during road closures, this is expected given that road closures are triggered by caribou presence within 1.5 km of the Haul Road and AWAR. This observation doesn't indicate that caribou are more or less likely to cross a closed road, rather that caribou in close proximity to roads are more likely to encounter a closed road because the closure was triggered by their proximity to roads. Based on the mitigation measures in place, caribou should be crossing closed roads more frequently than open roads.

The requested information in the Table 1.3-1 below. Agnico Eagle would also like to highlight closures which took place outside of migration dates outlined in the TEMP, during the period of August 6th to 15th, as well as December 16th to 31st, which demonstrates Agnico Eagle's commitment to protecting caribou migratory corridor right-of-way, and its variable nature. Furthermore, during the migration seasons outlined in the TEMP, 83.9% of observed caribou were seen during road closures, compared to the committed 75% in regards to TC 30. The full breakdown of percentage of caribou encountering a closed road can be found in Table 1.3-2.

Table 1.3-1 Road Status Explanation

Road	Date	Road Status According to GN	Explanation for road status
AWAR	2021/04/01	Open	Correction - Speed restrictions were applied to allow trips in progress to be completed. Monitoring was performed in the afternoon. Weather forecast presented a blizzard arriving, and the decision was taken to close the road prior to the start of Day shift on April 2nd, as there are no hauling activities on night shift.
AWAR	2021/04/12	Speed Restrictions	AWAR was reopened following the morning road survey, as no groups of caribou above GST were observed. Afternoon survey resulted in the observation of a single group of caribou above GST within 1.5km. Trips in progress were allowed to be completed with a speed restriction, with a reassessment of caribou along the road to occur early the following morning, as there were no activities to occur on nightshift.



Road	Date	Road Status According to GN	Explanation for road status
AWAR	2021/04/13	Speed Restrictions	AWAR was reopened following the morning road survey, as no groups of caribou above GST, within 1.5km were observed. Afternoon survey resulted in the observation of a single group of caribou above GST within 1.5km. Trips in progress were allowed to be completed with a speed restriction, and environmental monitoring. The road was closed for night shift. Road maintenance were allowed to continue, as they are deemed essential for the purpose of maintaining the safety of the road.
AWAR	2021/05/07	Speed Restrictions	AWAR was reopened following the morning convoy escort, and a discussion between Agnico Eagle and the HTO Wildlife Coordinator.
AWAR	2021/05/08	Speed Restrictions	No groups of caribou were observed by the Agnico Eagle environmental group above GST. A report of a group of 41 caribou was sent by a road user with a hunter nearby. Upon arrival in the area, the environmental technician were not able to confirm the observation, but maintain the speed restriction in the area.
AWAR	2021/05/09	Speed Restrictions	Group of 58 Caribou were observed on the East side of the road, meaning caribou had already crossed the road. Road traffic would not cause migratory delays for this group.
AWAR	2021/05/10	Speed Restrictions	Discussion with HTO Wildlife Coordinator. Group of 72 caribou 1000m from the road
AWAR	2021/05/11	Speed Restrictions	Group of 39 caribou were reported by a road user. This group was not observed during road survey.
AWAR	2021/05/12	Speed Restrictions	Correction - no groups above GST. Largest group observed was 24 caribou at km100 during a road survey.
AWAR	2021/05/13	Speed Restrictions	Group of 37 caribou reported by road user at km33. This group was not observed during initial road survey.
AWAR	2021/05/14	Speed Restrictions	Group of 42 caribou reported by road user at km25. This group was not observed during initial road survey.
AWAR	2021/05/15	Speed Restrictions	Correction - no groups above GST. Largest group observed was 31 caribou at km105 during a road survey.
AWAR	2021/05/16	Speed Restrictions	Correction - no groups above GST Largest group observed was 26 caribou at km106 during a road survey.
AWAR	2021/05/17	Speed Restrictions	Group of 40 caribou observed during road survey.
WTHR	2021/04/13	Speed Restrictions	No Caribou above GST observed during morning survey. Afternoon survey resulted in the observation. Monitoring took place in the area, and decision was taken to reassess the following morning, at which point the road was closed.
WTHR	2021/04/16	Speed Restrictions	Road reopened following morning monitoring revealed no groups above GST. Report later in the day of 75 caribou.
WTHR	2021/04/17	Speed Restrictions	Observation of a single group (40 caribou) above GST during road survey. Road kept open with speed restrictions, and environmental staff monitored the area.
WTHR	2021/04/23	Speed Restrictions	Observation of a single group (50 caribou) above GST at 1.2km from the road. Speed restrictions applied and monitoring was performed. Road to be reassessed the following day, where no caribou groups above GST were observed.
WTHR	2021/04/25	Speed Restrictions	Observation of a single group (40 caribou) above GST at 800m from the road. Road kept open with speed restrictions, and environmental staff monitored the area.

Road	Date	Road Status According to GN	Explanation for road status
			Decision was taken to reassess the following morning, at which point the road was closed.
WTHR	2021/05/06	Speed Restrictions	Agnico Eagle believes there are date errors in the database for the northern portion of the Whale Tail Haul Road. Presented data shows 5 groups above GST in the northern half of the road, but these observations were made on May 5 th , and not May 6 th . This is further confirmed through the daily caribou migration communication sent to stakeholders, where there were no mention of any large group of caribou in the northern half, whereas on the 5 th , groups above GST were communicated. For the caribou on the southern half of the road, they were observed to have crossed, as per the daily communication. Road was reopened with speed restriction following their crossing.
WTHR	2021/05/07	Speed Restrictions	Observation of a single group (66 caribou) above GST during road survey. Road kept open with speed restrictions, and environmental staff monitored the area.
WTHR	2021/05/21	Speed Restrictions	Report of a single group (55 caribou) above GST by road user. Road kept open with speed restrictions, and environmental staff monitored the area.

Table 1.3-2. Caribou population encountering a closed road

Migration Season	Road	% of caribou encountering a closed road	Number of Caribou Encountering Closed Road	Total Observed Caribou
Spring	AWAR	79.1%	13,219	16,721
Spring	WTHR	81.6%	10,640	13,044
Fall	AWAR	93.9%	15,716	16,744
Fall	WTHR	0.0%	0	636
Annual Migration Seasons Total		83.9%	39,575	47,145

References

Golder (Golder Associates Ltd.). 2020. Lorillard caribou movements: Implications from interacting with the Whale Tail Haul Road and All-weather Access Road. Prepared for Agnico Eagle Mines Ltd. By Golder Associates Ltd. Victoria, BC.

Plante S, Dussault C, Richard JH, Garel M, Côté SD. 2020. Untangling effects of human disturbance and natural factors on mortality risk of migratory caribou. *Frontiers in Ecology and Evolution* 8:154. doi: 10.3389/fevo.2020.00154

2. That the Proponent explain what is meant by “Speed Restrictions” that were implemented on Project roads on the dates listed in table 1 above and where in the TEMP version 7 this is a prescribed response to the observation of caribou above Group-Size Threshold (GST) and within 1.5 km of a road.



Agnico Eagle's Response: *"Speed restrictions" should be understood as "speed reduced to 30km/h", as per figure 6-10 of the TEMP. During those dates, road users were capped to 30km/h when travelling in areas where caribou were present.*

3. That the Proponent provide, in all future Annual Reports, details of the duration of road closure for each of the days a Project Road is closed.

Agnico Eagle's Response: *Agnico Eagle will include the duration of the road closures as part of future annual reporting. It is important to note that the information will not be available for the first half of 2022, as data is not recorded in a manner to allow this. Moving forward this will be done.*

4. That the Proponent provide, in all future Annual Reports, details on the consultations that took place and the information upon which reopening was based for each of the days a Project Road is closed.

Agnico Eagle's Response: *The reason for reopening are already presented in Appendix B of the Wildlife Monitoring Summary Report. Furthermore, Agnico Eagle is looking to include additional context on which roads can be reopened in the next iteration of the TEMP. In future annual report, Agnico Eagle will look to include additional information on the communication and context upon which roads were reopened.*

5. That the Board direct the Proponent to immediately implement the Project's caribou protection measures fully and consistently, in accordance with the approved TEMP's v. 7 GSTs, Distance Thresholds, and decision trees; including the automatic road closures specified in these decision trees (AEM 2019a, Figures 6 to 10).

Agnico Eagle's Response: *N/A*

1.4 Caribou Behaviour Study

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

References: Agnico Eagle Mines (AEM) Ltd. (2019). Meadowbank Division Terrestrial Ecosystem Management Plan, Version 7. Agnico Eagle Mines (AEM) Limited. (2022). Meadowbank Complex 2021 Annual Report, Appendix 47 – Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report. Boulanger, J., R. Kite, M. Campbell, J. Shaw and D.S. Lee. (2020). Analysis of Caribou Movements Relative



to the Meadowbank Mine and Roads During Spring Migration. Government of Nunavut, Department of Environment, Technical Report Series – No:01-2020. 31 July 2020.

Identification of issue: In the Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report, the Proponent provides an update on the Meadowbank Gold Mine Caribou Behaviour Study (AEM 2020, Appendix L). The main findings of this Study were that caribou close the road responded to disturbances such as traffic, exhibiting behaviors such as increased alertness, trotting or running lasting up to 3 to 6 minutes after exposure. However, the Report does not place these findings in the context of traffic intensity on the Project's roads, in particular the Whale Tail Haul Road (HR). This makes it challenging for reviewers to assess the significance of the Study's findings. Additional analyses are recommended in future Annual Reports.

Additionally, walking was the second most common behavior observed during the study. Caribou may walk for a variety of reasons including to seek forage, to migrate or to move away from a disturbance. The study design and subsequent analyses did not attempt to distinguish between these types of walking behaviour and may thus be failing to detect an important response to disturbance. Recommendations on a revised study design are provided.

Importance to review and supporting rationale:

Significance of the Study's Findings

The Caribou Behavior Study found that:

"Overall, the results of the statistical analysis provided support for the key hypothesis that caribou tend to respond to disturbances, particularly when they are close to the road. However, the analysis also found that disturbances did not have a detectable effect on caribou behaviour after three to six minutes."

(AEM 2022, s17.2.4)

This finding should be placed in context with information on the intensity of traffic on Project roads, in particular the HR. This would allow the Proponent and other parties to assess the significance of the Study's findings and potential adaptive management responses. For example, using traffic levels provided in the report (Table 12), and accounting for periods of road closure (Table 9) it can be estimated that there was an average of about 1 vehicle per 7.5 minutes on WTHR during spring migration in 2021. Comparing this to the findings of the behaviour study it can be estimated that at any point on the road, a caribou could be exposed to a disturbance source 8 times per hour. With responses to disturbance lasting 3-6 minutes, an individual caribou could potentially spend as much as 24 to 48 minutes per hour exhibiting disturbance behaviours.



These preliminary calculations do not account for variation in traffic intensity on the HR over the course of a 24-hour period, such as peaks in traffic during daylight hours and lows during nighttime if such variation exists. A more detailed analysis of traffic intensity should be provided in future Annual Reports including patterns of traffic intensity within 24-hour periods, while the Project's roads are open. Data collected in gate house logs and from the Proponent's remote trigger camera program can be used in these analyses.

Data on Walking Behavior

As noted in the report:

"In response to comments from the KivIA, the behaviour of "walking" was investigated for whether it may be an "alert" behaviour instead of a non-response behaviour, however, disturbances did not statistically affect the proportion of caribou walking....."

(AEM 2022, s17.2.3)

And

"For the analysis, walking data was still kept separate from running or alert behaviours (the previous response behaviours), because the proportion of caribou walking was substantially higher at any given time than the proportion exhibiting alert or running behaviour. Grouping the three "response" behaviours together would risk washing out the potentially higher stress behaviours of alert and running."

(AEM 2022, s17.2.2.2)

Walking was the second most common behavior observed during the study seemingly comprising approximately 25-33% of observed behaviors (AEM 2022, Appendix L, figure 6.3-2). Caribou may walk for a variety of reasons including to seek forage, to migrate or to move away from a disturbance. The study design was not suited to differentiating amongst these different reasons for walking. Consequently, the Study may be failing to detect an important response to disturbance. Revisions to the study design should be made in-order to further study walking as a potential disturbance response. For example, observers should record the direction of walking so that analyses can consider whether caribou are walking towards, away or parallel to road. Notwithstanding the direction of migration, the latter two orientations may be responses to disturbance, as has been seen in collared caribou (Boulanger et al 2020).

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



1. That the Proponent provide, in all future Annual Reports, a more detailed analysis of traffic frequency on the Project's roads. This should include the frequency of traffic (vehicle passages/minute) for the Whale Tail Haul Road and All-Weather-Access-Road (AWAR) for spring and fall caribou migration periods covering days when road is in full operation. This should also include daily average, minimum and maximum frequencies, and an analysis of patterns of traffic intensity during the Project's 24-hour daily work cycle.

Agnico Eagle's Response: *Agnico Eagle has a daily traffic log for each road, but the current format of data recorded will make it difficult to have accurate information. It should be noted that because traffic data are only available for one spatial point on the haul road and on the AWAR, the estimate of traffic intensity would have to be extrapolated for the whole road for every day and then redistributed, and may not perfectly reflect the conditions experienced by caribou at that location in that moment. This uncertainty will be a caveat on any conclusions that can be reached on subsequent data analyses. This information will be explored for the 2022 report to determine the approximate traffic intensity for the period in which the behaviour surveys occur.*

2. The behaviour study's design should be revised to collect data on the direction caribou are walking to distinguish between individuals walking towards, away or parallel to Project roads.

Agnico Eagle's Response: *Based on the comments from the GN on the 2021 report, a field will be added to indicate the direction of walking in relation to the road for the remainder of the 2022 field season. This will be an important step towards being able to separate "walking" into response and non-response behaviours. With this additional data collection in 2022, the objective will be to separate behaviours into additional classes: walking parallel to road, walking away from road, and walking towards road.*

For the existing dataset up to 2022, response and non-response walking cannot be reliably separated without making risky assumptions. For example, caribou that were walking at the start of the survey may be responding to unknown disturbances that occurred before the survey started and would be mis-classified as non-response walking. Nevertheless, it is acknowledged that walking should be included in the models in some fashion as it is an important component of response behaviour, as the GN and KIA have both observed. Walking will be included in analyses in the 2022 analysis as a separate response variable, in the same way that it was included for the 2021 report. Additional data collection from 2022 increases the likelihood that a statistical effect of traffic on walking behaviour will be detected, even with the relative noise inherent in the observation of walking behaviours.



The inclusion of walking behaviour into estimations of “duration of response” will be also explored in the 2022 analysis. Some workshopping on the best way to do this may be required at a TAG meeting, as caribou walking before a disturbance occurred may continue to walk after the disturbance, but not in response to the disturbance.

1.5 Remote Camera Study

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

References: Agnico Eagle Mines (AEM) Ltd. (2019). Meadowbank Division Terrestrial Ecosystem Management Plan, Version 7. Agnico Eagle Mines (AEM) Limited. (2022). Meadowbank Complex 2021 Annual Report, Appendix 47 – Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report.

Identification of issue: In the Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report, the Proponent provides an update on the results of the Remote Camera Program. This Program is designed to study the road crossing behaviour of caribou by collecting both time lapse and remote triggered images of caribou as they cross the Project’s Whale Tail Haul Road (HR). Of note is the result showing that of 12 of the 13 caribou crossing events detected on camera occurred while the road was closed to traffic during the spring migration period. The 12th crossing events occurred during a period of speed restriction on the road.

Despite the small sample size, this result provides compelling evidence that caribou are far more likely to cross the HR when it is closed. However, the Report fails to discuss the significance of this finding alongside the growing body of evidence that road closure status significantly affects caribou migration through the Project (See GN 2021 Annual Report comment – Road Closures for Migrating Caribou). Recommendations on adaptive management and/or further investigation of this finding are not made. Additionally, the Report does not utilize other sources of readily available data, within the Report’s appendices, to investigate caribou crossing behavior relative to road status (open/closed). For example, in reviewing the road survey data in Appendix A, the GN found that caribou appear to be about 4 times more likely to be observed crossing the HR when it is closed. The GN recommends further analyses of HR road survey data for the period 2019-2022.

Importance to review and supporting rationale: Table 46 of the report (AEM 2022) shows that 12 of 13 detected caribou crossings occurred during the spring migration period when the HR road was closed. Considering the HR was closed and open for 12 and 33 days, respectively, during this period (AEM 2022, table 9), this result suggests that caribou strongly avoid crossing the HR when it is open. When the HR was closed, the cameras detected 1 crossing per day. When the HR was open detection rate was 0.03



crossings/day. The Report does not further investigate this important finding using existing data or make recommendations for future investigation. This is a significant deficiency.

The Project's road surveys offer another source of data to investigate caribou crossing behaviour relative to road status (open/closed). The Report provides a summary of caribou crossings observed during road surveys in 2021 but does not provide any analysis of crossing data relative to road status (AEM 2022, section 3.6.8). In reviewing the road survey data provided in the Report (Appendix A), the GN finds that caribou appear to be approximately 4 times more likely to cross the HR during their spring migration while the road is closed (Tables 1 and 2). Similar results are apparent for the AWAR (Tables 3 and 4). Although samples sizes are small, these findings warrant further investigation using existing and future data. These results add to a growing body of evidence that an open HR presents a significant barrier to the movement of migrating caribou (see GN comment – Road Closures for Migrating Caribou). The GN urges the Proponent and the NIRB to take further immediate measures to investigate these findings and implement adaptive management to prevent disruption of caribou migratory behaviour.

Table 1. Road survey data for spring migration 2021, showing the total number of caribou observed and the number observed crossing the Whale Tail Haul Road when the road was open or closed.

Road Status	Total No. Caribou Observed	No. of Caribou Observed Crossing	% of Caribou Crossing
Open	2,294	34	1.5
Closed	10,612	700	6.6

Table 2. Road survey data for spring migration 2021, showing the total number of caribou groups observed and the number of groups observed crossing the Whale Tail Haul Road when the road was open or closed.

Road Status	Total No. Caribou Groups Observed	No. of Caribou Groups Observed Crossing	% of Caribou Groups Crossing
Open	146	1	0.7
Closed	182	5	2.8

Table 3. Road survey data for spring migration 2021, showing the total number of caribou observed and the number observed crossing the Meadowbank AWAR when the road was open or closed.

Road Status	Total No. Caribou Observed	No. of Caribou Observed Crossing	% of Caribou Crossing
Open	5,805	211	3.6
Closed	23,831	1,525	6.4



Table 4. Road survey data for spring migration 2021, showing the total number of caribou groups observed and the number of groups observed crossing the Meadowbank AWAR when the road was open or closed.

Road Status	Total No. Caribou Groups Observed	No. of Caribou Groups Observed Crossing	% of Caribou Groups Crossing
Open	352	31	0.9
Closed	508	20	3.9

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

1. That the Proponent continue the Remote Camera Program and expand the Program through deployment of additional cameras to increase and acquire a large sample of caribou crossing photographic data.

Agnico Eagle's Response: *Agnico Eagle will consider including additional cameras in the monitoring program and will discuss with the TAG at a future meeting.*

2. That the Proponent conduct an analysis of road survey data for the Whale Tail Haul Road for the period 2019 to 2022 looking at observations of caribou crossing relative to road status. Findings of this analysis should be included in the 2022 Annual Report.

Agnico Eagle's Response: *Road surveys are not designed to quantify the proportion of observed caribou groups that cross roads, nor are they appropriate for interpreting caribou responses to road mitigation, and should not be used as such. They are designed to quantify caribou group sizes and proximity along the length of the Haul Road and AWAR to inform mitigation actions, such as road closure, in accordance with the TEMP (Version 7, Agnico Eagle 2019). A greater proportion of caribou groups are expected to be observed crossing roads when roads are closed, as GST numbers will be exceeded. The road closure is triggered because caribou groups are closer to either the Haul Road or AWAR. To assess the effectiveness of road closure mitigation would require monitoring caribou crossing frequencies in the presence of different treatments of road closure (i.e., closed versus open). To complete this type of assessment it would be necessary for some caribou groups within 1.5 km that exceed the GST to be exposed to an open road. Further discussion with the TAG is required to explore such a monitoring program.*

3. That the Proponent explain what adaptive management response will be implemented to address the findings of the camera program which suggest that migrating caribou cross during periods of road closure and strongly avoid crossing an open Whale Tail Haul Road.



Agnico Eagle's Response: *Similar to response #2, the higher incidence of crossing events recorded by cameras during road closures is expected and supports that road closures are effective mitigation. Crossing events should be more frequently recorded when the Haul Road is closed. Haul Road closure is triggered because caribou groups are closer to the road. Managing road activity, such as full and partial road closure, is already a form of mitigation implemented by Agnico Eagle. The low number of crossing events when the road is open do not provide support for caribou strongly avoiding roads.*

4. That NIRB direct the Proponent to implement fully and consistently the existing automatic road closure provisions in the Project's TEMP (AEM 2019). (See GN 2021 AR comment – Road Closures for Migrating Caribou).

Agnico Eagle's Response: *N/A*

2 Fisheries and Oceans Canada (DFO)

2.1 Effects Monitoring

DFO is generally agreeable with Agnico Eagle's reporting and has the following comments and concerns related to effects monitoring:

2.1.1 Annual Geotechnical Inspection

Section/Document: Appendix 9: Meadowbank and Whale Tail 2021 Annual Geotechnical Inspection – Table 2

Concern: Culverts requiring repair maintenance identified in 2019 have not been repaired.

Request 1: Proponent to provide a plan for repair and/or replacement of damaged and obstructed culverts prioritizing repairs to culverts with potential to affect fish passage and fish and fish habitat.

Agnico Eagle's Response: *The culverts identified in 2019 were the culverts on the Whale Tail Project road. During the 2021 inspection it was noted that the culverts were in good condition. In 2019 it was recommended to pay special attention to a number of listed culverts but specific repairs were not required. Golder recommended the following in the 2019 report and it is still the case in the 2021 report "If insufficient capacity to manage runoff is observed at the time of the spring freshet, then it would be recommended to clear the obstructions or repair the culverts. It is also recommended to monitor the erosion progress of culverts # 167 (41 + 843) and # 232 (53 + 928) since there are signs of water flow below the road at these locations. Culvert erosion should be monitored during the spring freshet." Following these recommendations, in 2019, Agnico put into place a culvert*



inspection program to be carried out by the road crews during the freshet and open water season. This inspection program is still in place and during the 2021 freshet the culverts had sufficient capacity to manage the runoff and no erosion problems were observed. The inspection of the culverts is continuing in 2022 by the road crews and the culverts will be closely inspected once again during the upcoming 2022 annual geotechnical inspection.

2.1.2 Report on the Implementation of Measures to Avoid and Mitigate Serious Harm

Section/Document: Appendix 38: Whale Tail 2021 Report on the Implementation of Measures to Avoid and Mitigate Serious Harm – Sec. 2.1.2.3

Concern: Construction for diffuser installation occurred from September 3 to November 4 TSS samples were only collected in September. Field-measured depth profiles for conductivity were used as a surrogate for TSS.

Request 2: Proponent to provide justification for use of conductivity as a surrogate for TSS parameters for the October/November construction activities.

Agnico Eagle's Response: *The sediment control strategy as detailed in the design report for this construction event indicated that visual observations of turbidity/TSS would be used to determine any need for supplemental sediment control measures (e.g. silt curtains), rather than water quality sampling. No turbidity/TSS was noted by the construction team, so supplemental measures were not required. However, to further comment on the possibility of any construction-related TSS excursion in the context of the Serious Harm Mitigation Report, Agnico cross-examined results of other receiving-environment monitoring programs. During the construction period of September 3 – November 4, 2020, TSS was only required to be analyzed once in the vicinity of the construction location (Whale Tail South) through the CREMP (September 8), and results were similar to baseline, as indicated in the report. While conductivity measurements were performed in August, October, and November and also reported as a general indicator of potential mine-related disturbance, Agnico agrees with DFO that conductivity is not a measure of or surrogate for TSS, and will be sure to adjust this language in the future.*

2.1.3 Fish Habitat Offsets Monitoring Report

Section/Document: Appendix 44: Whale Tail 2021 Fish Habitat Offsets Monitoring Report – Sec. 2.1.2.3.1 Flood Zone Habitat



Concern: Minimum sample size for slimy sculpin objective not met for Flooded Lakes (A65 and A20) and Reference Lakes (Lake 8 and A44).

Request 3: Proponent to provide additional information on insufficient sample size for slimy sculpin in Flooded Lakes (A65 and A20) and Reference Lakes (Lake 8 and A44).

Agnico Eagle's Response: *As noted by DFO, the research program on which the FHOMP small-bodied fish assessment methods are based targets a minimum catch of 30 Slimy Sculpin per waterbody in order to statistically compare various metrics between flood zone and reference systems. In 2021, this target was not met in four of eight waterbodies due to time constraints. While the research team was scheduled onsite for similar periods of time in 2020 and 2021, adverse weather conditions and logistical considerations meant that field time ended up being more limited in 2021. Since sample size targets were met for the primary flood zone location (WTS), as well as A63, Mammoth Lake, and reference lake B03, and since the complete dataset will include four post-flood monitoring years (2020 – 2023), Agnico expects that overall study results will be minimally impacted but the reduced sample size in some lakes in 2021.*

2.1.4 Marine Mammal and Seabird Report – Local Marine Monitors

Section/Document: Appendix 57: Meadowbank and Whale Tail 2021 Marine Mammal and Seabird Report – PC 004, Cond. No. 36

Concern: Local area marine mammal monitors have not conducted surveys aboard vessels transitioning between Chesterfield Inlet and Baker Lake.

Request 4: Proponent to meet with DFO to discuss the monitoring effort for Marine Mammal Observations to ensure the robustness of the survey design and adequacy of mitigation measures

Agnico Eagle's Response: *In 2021 (as in 2020), community members were not permitted to board vessels due to health and safety restrictions in place related to the Covid-19 pandemic. Therefore, Groupe Desgagnés and Woodward had their MMSOs record sightings of marine mammals and seabirds when possible while travelling on the barge. In 2022, as some of the Covid mitigation measures has been lifted, Agnico Eagle was able to send a local MMSO monitor on the fuel barge for the first discharge taking place between July and August. If pandemic measures remain similar, local MMSO monitor is also schedule to be part of the second fuel discharge in September. Surveys effort and observation will be provided as part of the 2022 Marine Mammal and Seabird Report. Agnico Eagle is committed to meeting with DFO to discuss the robustness of survey design and adequacy of mitigation measures at their earliest convenience.*



2.1.5 Marine Mammal and Seabird Report – Survey Transects

Section/Document: Appendix 57: Meadowbank and Whale Tail 2021 Marine Mammal and Seabird Report – PC 004, Cond. No. 36

Concern: In 2021, no marine mammal survey transects were conducted by Groupe Desgagnés and Woodward MMSOs due to navigational requirements, or due to low light and darkness during transit between Helicopter Island and Baker Lake.

Request 5: Proponent to meet with DFO to discuss the monitoring effort for Marine Mammal Observations to ensure the robustness of the survey design and adequacy of mitigation measures

Agnico Eagle's Response: *Although no marine mammal survey transects were conducted by Group Desgagné's and Woodward between Helicopter Island and Baker Lake, in 2021 there were nine (9) seabird transect surveys and twenty-five (25) stationary marine mammal surveys that were conducted while the vessel was anchored at Helicopter Island. In 2022, as some of the Covid mitigation measures has been lifted, Agnico Eagle was able to send a local MMSO monitor on the fuel barge for the first discharge taking place between July and August. If pandemic measures remain similar, local MMSO monitor is also schedule to be part of the second fuel discharge in September. Surveys effort and observation will be provided as part of the 2022 Marine Mammal and Seabird Report. Agnico Eagle is committed to meeting with DFO to discuss the robustness of survey design and adequacy of mitigation measures at their earliest convenience.*

2.1.6 Marine Mammal and Seabird Report – Survey Transects

Section/Document: Appendix 57: Meadowbank and Whale Tail 2021 Marine Mammal and Seabird Report – Sec. 3.2.2 Marine Mammal Observations 2021

Concern: No mitigation measures were implemented for Fin Whale Observation – observed at 15m distance. Shipping management plan Mitigation Measures (app 56, Sec. 4.2) states that vessel will slow if marine mammals approach with 500m.

Request 6: Proponent to meet with DFO to discuss the monitoring effort for Marine Mammal Observations to ensure the robustness of the survey design and adequacy of mitigation measures.

Agnico Eagle's Response: *Agnico Eagle has met with the shipping companies prior to the 2022 shipping season to reinforce MMSO protocol and mitigation measures. Agnico Eagle will continue to work alongside and provide resources to the shipping companies to ensure that forms are being filled out with the correct information. Agnico Eagle is committed to meeting with DFO to discuss the robustness of survey design and adequacy of mitigation measures at their earliest convenience.*



2.2 Compliance Monitoring

No compliance monitoring or site visits/inspections were conducted by DFO in 2021. Furthermore, no amendments were made to the proponent's Fisheries Act Authorization issued by DFO in 2020.

The proponent is largely compliant with the terms and conditions that pertain to DFO's mandate. DFO will continue to work with the proponent to ensure compliance.

Agnico Eagle's Response: *Agnico Eagle acknowledges DFO's response.*

3 Crown-Indigenous relations and Northern Affairs Canada (CIRNAC)

3.1 Whale Tail Project Post-Closure Water Quality

References: Meadowbank Complex 2021 Annual Report: Section 8.5.3.2; Appendix 13; Whale Tail Expansion Project Final Environmental Impact Statement: Appendix 6H)

Issue/Rationale: Arsenic is the primary contaminant of concern at the Whale Tail site. The Final Environmental Impact Statement (FEIS) for the Whale Tail Expansion Project predicted that arsenic in water collected from the IVR pit during operations would have a maximum concentration of 0.66 mg/L in 2021. In contrast, the Annual Report indicates that the maximum measured arsenic concentration in 2021 within the IVR pit was 5.18 mg/L. The measured concentration is therefore eight times greater than the predicted value and more than 200 times greater than the 0.025 mg/L Site Specific Water Quality Objectives (SSWQO) for arsenic.

In addition to some parameters having higher than predicted concentrations, the volume of water requiring management has been higher than predicted in some instances. Notably, the volume of water flowing into the Whale Tail Pit is roughly 50% greater than predicted in the FEIS.

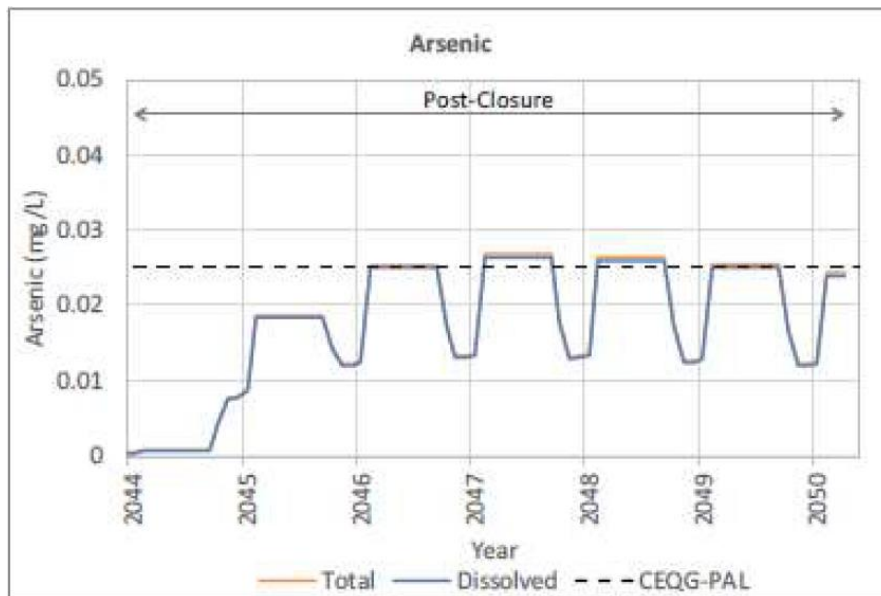
Increased concentrations of some parameters (e.g., arsenic) and increased water volumes should, in theory, result in higher contaminant loadings to surface water receivers. While this is effectively managed by AEM during operations, higher loadings during the post-closure phase have the potential to result in adverse impacts to surface water receivers. Nonetheless, CIRNAC notes that AEM's updated water quality predictions (as presented in Appendix 13) are generally similar to those presented in the FEIS for the Expansion Project. Specifically, as illustrated in the following figure, average arsenic concentrations in Mammoth Lake during the postclosure phase are currently predicted to slightly exceed the arsenic SSWQO for several years. That prediction is generally similar to estimates that were presented in the FEIS for the Expansion Project.



It is unclear to CIRNAC why the increased arsenic loadings that have been observed during the operational phase (as indicated by pit sump water monitoring data) are not resulting in post-closure water quality predictions that are worse than predicted in the FEIS for the Expansion Project. Additional information is required on any adjustments AEM has made to the water quality prediction model.

CIRNAC also notes that AEM continues to indicate that water quality predictions are accurate within one order of magnitude. On this basis, it is CIRNAC's understanding that post-closure arsenic concentrations within Mammoth Lake could be up to ten times higher than currently predicted. Given that current predictions already slightly exceed the SSWQO for arsenic, average post-closure arsenic concentrations in Mammoth Lake could be ten times greater than the SSWQO and still remain within the FEIS predictions.

Last, CIRNAC notes that the predictions provided in Appendix 13 to the 2021 Annual Report represent average concentrations within a fully mixed water body. In general, it should be expected that spatial heterogeneity will result in concentrations being higher than average at some locations within the lake (e.g., in the vicinity of the flooded pits and/or passive discharges of seepage from the Waste Rock Storage Facilities (WRSFs). Given the limited "margin of error" between the predicted average concentrations and the SSWQO for arsenic, it is likely that some areas within Mammoth Lake will have arsenic concentrations that are well above the SSWQO. Additional details on this spatial heterogeneity are required.



(Figure extracted from Figure 7 of: Whale Tail Project – Meadowbank Complex 2021 Annual Report – Closure and Post-Closure Water Quality Predictions (Golder, March 2022) as presented in Appendix D of Appendix 13 to AEM's 2021 Annual Report)



Recommendation to Address Issues: CIRNAC recommends that AEM address the following in the next iteration of the Whale Tail Interim Closure and Reclamation Plan:

a) Clearly indicate which modelling parameters have been adjusted since the last modelling run. In situations where the level of conservatism has reduced relative to FEIS predictions, appropriate justification should be provided.

Agnico Eagle's Response: *Agnico agrees with CIRNAC's recommendation to indicate which modelling parameters have been adjusted since the last modelling run and to explain situations where the level of conservatism has reduced relative to FEIS predictions. It should be noted that as per NWB Water License 2AM-WTP1830 Schedule B, Item 9, the complete water quality forecast model is updated yearly, and included in the Annual Report. Therefore, this recommendation will be included in next year water quality forecast model. The Whale Tail Interim Closure and Reclamation Plan refers to the water quality forecast model, but however does not include the modelling process in great details.*

b) Future modelling results should explicitly and quantitatively report the range of predicted modelling outcomes based on AEM's assumptions regarding model prediction accuracy (i.e., +/- one order of magnitude). Any required mitigations should be based on a reasonable worst-case scenario. For example, what actions would be required if post-closure arsenic concentrations in Mammoth Lake are at the upper end of the potential prediction range?

Agnico Eagle's Response: *Agnico agrees with CIRNAC's recommendation for the next iteration of the water quality forecast model to explicitly report the range of predicted modelling outcomes based on model prediction accuracy. It will be ensured that the consultant performing the water quality forecast discusses the prediction accuracy of the model within the report as it is possible this may have changed since modelling was first performed.*

c) Water quality predictions should clearly indicate the spatial extent of post-closure water quality exceedances within surface water receivers.

Agnico Eagle's Response: *Agnico acknowledges CIRNAC's recommendation for the next iteration water quality forecast model to clearly indicate the spatial extent of post-closure water quality exceedances within surface water receivers.*



3.2 Fuel Storage Facility Management

References: Meadowbank Complex 2021 Annual Report: Section 7.1.1, Appendix 28; Meadowbank Complex 2021 Annual Report: Section 8.5.5.2, Appendix 9 and 15

Issues/Rationale: Proper operation care and maintenance of fuel storage facilities is critical to ensuring potential impacts to the environment are prevented. In this regard, AEM has an extensive program to address tanks, piping and related fuel handling and storage components. For the most part, these components are all within secondary containment designed to ensure that releases to the environment are prevented.

AEM notes that monthly inspections of the facilities are conducted that assess tank and piping condition, secondary containment berm structure and integrity, indicators of liner damage, precipitation/runoff accumulation, evidence of tampering or misuse, any structural abnormalities and visible sheens on contact water pools and crush material inside the secondary containment.

Review of the 2021 Annual Report indicates that there are ongoing issues with fuel management facilities, such as water management within the various fuel storage facilities and minor to moderate issues related to the integrity of facility civil works for secondary containment as identified in the 2021 geotechnical inspections, and with spills related to fuel storage facility operations including for example exposed and ripped geomembranes, animal burrowing near the south side of tanks 3 and 4, and the ongoing presence of ponded water within secondary containment areas. Some of these issues are outstanding since the 2020 inspection while some are recurring.

In addition to physical aspects, in Table 7-2 of the 2021 Annual Report notes that on September 10, 2021, there was an accidental discharge of 280 m³ of water from secondary containment that was potentially contaminated with petroleum hydrocarbons. As indicated in Table 7.2 of the 2021 Annual Report, AEM initiated an internal investigation to assess the accidental discharge.

Recommendation to Address Issues: CIRNAC requests that AEM:

- a) Provide the results of internal investigations into the cause of any spill in future annual reports.

Agnico Eagle's Response: Results from internal investigations for spills are included as part of the follow-up reports that are submitted to the Government of Nunavut Spill Hotline. The reports submitted for spills occurring during 2021 at Meadowbank have been included in Appendix 28 of the 2021 Annual Report.

- b) Carry out a comprehensive root cause review as to why there are year over year repeated observations of secondary containment concerns related to both liner integrity and water ponding within the secondary containment systems.



Agnico Eagle's Response: *Agnico Eagle will carry out a comprehensive assessment of the Baker Lake marshalling facilities secondary containment and will provide the findings in the 2022 Annual Report.*

c) Address any findings and recommendations of the root cause review to ensure environmental risks are mitigated through compliance and due diligence.

Agnico Eagle's Response: *Agnico Eagle will address any findings from is review.*

3.3 Employee Origin

References: AEM Responses to Review Comments on the 2020 Meadowbank and Whale Tail Annual Report, 29 July 2021.; Meadowbank Complex 2021 Annual Report: Section 11.10.1, Table 1-1; Appendix 59 - 2021 Socio-Economic Monitoring Program; NIRB Project Certificate 004 (Amendment 003) Term and Condition 65.; NIRB Project Certificate 006 (Amendment 002) Term and Condition 101

Issue/Rationale: Last year, as part of its review of the 2020 Annual Report, CIRNAC was unable to locate employee origin details beyond the community of origin of Inuit employees by Kivalliq community. CIRNAC recognises that Project Certificate 004 (Amendment 003) (PC 4), Term and Condition (T&C) 65 for the Meadowbank Gold Mine has a parallel under AEM's Meliadine Gold Mine Project Certificate 006 (Amendment 002) (PC 6), T&C 101, which requires AEM to report on employee origin details. In CIRNAC's review letter that was submitted to the NIRB with respect to AEM's 2020 Annual Report, it recommended that AEM align this aspect of the Meadowbank Complex Annual Report to the same reporting schema practiced for the Meliadine Gold Mine to allow for better understanding of the socio-economic impacts of the Meadowbank Complex, as well as consistency in reporting across AEM's Kivalliq projects.

Pursuant to T&C 101 of PC 6, AEM:

"...shall include with its annual report to the NIRB a summary of employee origin information as follows:

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



In its July 29, 2021 response to comments submitted on the 2020 Annual Report, AEM provided sufficient reference to where the recommended information is provided within its 2020 Socio-Economic Monitoring Report.

CIRNAC notes that the 2021 Socio-Economic Monitoring Report does not present similar information on employee origin nor does Section 11.10.3 of the 2021 Annual Report, which is identified as the relevant report section pursuant to Table 1-1, entitled "Meadowbank and Whale Tail List of Reporting Requirements" of the 2021 Annual Report (p. 6). Section 11.10.3 of the 2021 Annual Report provides employee origin information for AEM Inuit employees by community of hire in the Kivalliq Region as well as the broader categories of Kitikmeot, Qikiqtani and outside of Kivalliq. Similarly, Section 1.3 of the 2021 Socio-Economic Monitoring Report presents the origins of employees and contractors by community in the Kivalliq Region. Less detail is provided than what is included in Appendix C of the 2020 Socio-Economic Monitoring Report which aligns with T&C 101 of PC 6.

Recommendation: CIRNAC recommends that future AEM Annual Report submissions include details of employee origin in a manner consistent with the requirements of PC 6 T&C 101 which applies to the Meliadine Gold Mine.

Agnico Eagle's Response: *Agnico Eagle agrees to include detailed breakdown of headcount data by employee location, Inuit and non-Inuit status and project for future Annual Report submission. Furthermore, Agnico Eagle will ensure the employment origin data remains consistent with the T&C 101.*

3.4 Semi-Annual Calls with Government of Nunavut Career Development Personnel

References: Previously CIRNAC #8 in the 2020 Annual Report Review.; AEM Responses to Review Comments on the 2020 Annual Report, 29 July 2021; Meadowbank Complex 2021 Annual Report, Section 11.11.1.2; NIRB Project Certificate 008 (Amendment 001) Term and Condition 49.

Issue/Rationale: As part of its review of the 2020 Annual Report, CIRNAC noted that representatives of both AEM and the Government of Nunavut met once to satisfy the requirements of Project Certificate 008 (Amendment 001) (PC 8) Term and Condition (T&C) 49 which was issued for the Whale Tail Pit Project. This T&C states:

"The Proponent shall make best efforts to collaborate with the Government of Nunavut's Career Development Officer, Regional Manager of Career Development, and Director of Career Development. Semi-annual calls, at a minimum, should be initiated by the Proponent to address:

- *Hiring procedures and policies.*
- *Issues regarding employee recruitment and retention.*



- *AEM policies regarding career pathways and opportunities for advancement.*
- *Internal and/or partnered training and development of employees.*
- *Long-term labour market plans to facilitate training in communities.”*

This T&C requires AEM to make best efforts to initiate semi-annual calls, at a minimum, with appropriate Government of Nunavut personnel. In CIRNAC’s review letter that was submitted to the NIRB with respect to AEM’s 2020 Annual Report, it recommended that AEM work toward meeting with Government of Nunavut representatives more frequently than once a year.

CIRNAC notes that maintaining regular communications will assist efforts to implement measures that maximize Inuit hiring and capacity development within the region.

In its July 29, 2021 response to comments submitted on the 2020 Annual Report, AEM acknowledged CIRNAC’s recommendation and confirmed that it will strive to hold semi-annual calls or meetings with the Government of Nunavut’s Career Development Officer, Regional Manager of Career Development, and Director of Career Development pursuant to the recommended best practice outlined in PC 8 T&C 49.

In 2021, AEM did not meet with the Government of Nunavut to satisfy the requirements of PC 8 T&C 49. This is reflected in Section 11.11.1.2 of the 2021 Meadowbank Complex Annual Report.

Recommendation: CIRNAC recommends that AEM hold semi-annual calls, at a minimum, with appropriate Government of Nunavut personnel to review the discussion points presented in PC 8 T&C 49.

Agnico Eagle’s Response: *Agnico Eagle agrees with CIRNAC’s recommendation to hold semi-annual calls with appropriate Government of Nunavut personnel to support the development of Inuit hiring capacity within the region. In early 2021, Agnico Eagle initiated and scheduled a meeting with the Government of Nunavut and Family Services however, it was cancelled due to unforeseen circumstances due to COVID-19 pandemic. In November 2021, Agnico Eagle representatives attempted again to schedule a second meeting with the Government of Nunavut and Family Services, but the contact person was on leave for personal reason. Due to the unforeseen challenges rooted to COVID-19 pandemic, in addition to workforce challenges faced by the Government of Nunavut both parties decided to postpone the meetings to early 2022.*

Agnico Eagle believes that they have demonstrated best efforts towards T&C 49.



4 Kivalliq Inuit Association (KivIA)

4.1 Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report - Terrestrial Advisory Group

References: Appendix 47: S 1.7; Terrestrial Advisory Group; Appendix 47: Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report (April 2022).

Comments: KivIA appreciates that Agnico Eagle has relied on TAG for advice from three virtual meetings in 2021 and that TAG's advice was used in seven sections of the 2021 annual monitoring report (S 1.7, pg 1-6). KivIA, however, suggests that Agnico Eagle should include a table summarizing TAG's contributions as how TAG contributed to refining monitoring and mitigation is not specified in these sections.

Although the 2021 Annual Report describes how the Mitigation Audit is to evaluate mitigation (S 1.8, pg 1-6), the evaluation was not included in the report. KivIA recommends that the TAG be involved in evaluating mitigation in preparation for Agnico Eagle's Mitigation Audit, as TAG's purpose includes evaluation of the effectiveness of mitigation measures.

KivIA notes uncertainties in evaluating mitigation effectiveness as it is unclear what criteria to use to measure effectiveness. For example, for roads are the criteria for mitigation effectiveness the percentage of caribou encountering the roads when they are closed or the numbers of caribou seen crossing? Agnico Eagle reports that on average 80% and 24% of observed caribou encountered the AWAR and WTHR roads when closed, respectively (S 3.6.6, pg 3-14). The proportion of caribou observed crossing the roads was, however, low in spring (~1,300 for AWAR and 1,000 for WTHR; Table 14 and Figure 7) when the number of caribou encountering the road was high (~13,000 for AWAR and 10,600 for WTHR; Table 10), with roughly 10% of caribou encountering the roads actually observed crossing. Average road crossings were high in December when the percentage of caribou encountering the road was also high but the information is not presented as to the percentage crossing when the roads are closed.

TAG's eight purposes (S 1.7) for TAG are comprehensive, which suggests Agnico Eagle has high expectations of TAG contributions. Agnico Eagle also identifies throughout the 2021 annual report future topics to be discussed with TAG. However, given the number of topics, KivIA is concerned that the proposed shift to only in-person meetings has the disadvantage of potentially reducing the frequency of TAG meetings and reducing the number of participants.

Recommendation 1: Agnico Eagle should:

- 1) Provide a summary table of TAG advice in annual reports;
- 2) Obtain input from TAG on the annual Mitigation Audit; and
- 3) Allow virtual as well as in-person attendance at TAG meetings.



Agnico Eagle's Response:

- 1) *Agnico Eagle will include a table of TAG comments and recommendations on the annual wildlife monitoring report and the Terrestrial Ecosystem Management Plan (TEMP). Agnico Eagle has altered mitigation and monitoring based on comments and recommendations by the TAG. Examples include the snow study and its design and caribou behaviour monitoring (including in response to blast over-pressure and vibration).*

Section 4, of the Terrestrial Advisory Group (TAG) Terms of Reference (Agnico Eagle 2018) outlines that advice from the TAG must be officially designated as such, be clearly written and must be evidence based. To date, the TAG has not provided official advice to Agnico Eagle according to the Terms of Reference.

- 2) *Agnico Eagle welcomes TAG comments on the annual Mitigation Audit.*
- 3) *Agnico Eagle has allowed TAG organizations and their support staff to attend by teleconference or virtually and plans to continue this. Agnico Eagle would like for TAG organizations to have at least one representative present at meetings, if possible.*

References

Agnico Eagle. 2018. Terms of Reference: Terrestrial Advisory Group. October 24, 2018

4.2 Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report - Caribou Management Decision Tree

References: Appendix 47: S 2.0 Caribou Management Decision Tree

Comments: Agnico Eagle does not, in the 2021 Wildlife Monitoring Summary report, report on how the Decision Tree Levels 1, 2 and 3 were applied. Appendix A does include group size, whether or not the threshold (Group Threshold) was exceeded and whether speed restrictions or road closure were applied (i.e., Level 3). Collars as a trigger are not included or assessed even from collar maps. Table 9 (S 3.6.6, pg 3-14) summarizes speed restrictions and road closures by month, but not the thresholds or Level 1 or 2 mitigation.

Although the TAG has spent a lot of time on the groups size thresholds (GST), the group sizes are relatively arbitrary and miss the lead caribou for the migration. Agnico Eagle should summarize days with caribou and group size in the days preceding the first road closure and following the last closure. This summary will assess mitigation relative to caribou leaders, the duration for both spring and fall migrations, and how



effective the GST is to protect caribou. For example, on April 1, 2021, a group size of 175 caribou only triggered a speed restriction; Appendix A, pg 2.

Recommendation 2: Agnico Eagle should summarize the caribou encountering the roads and mine site relative to the three levels of thresholds and mitigation outlined in the Caribou Decision Trees to assess how effective the Trees are in triggering mitigation.

Agnico Eagle's Response: *Agnico Eagle does not agree that application and outcomes of decision trees are not reported. Section 3.6.5 of the report provides a summary of Road-related mitigation applied during 2021 and references both the collared caribou maps provided by the GN and the TEMP decision trees for caribou. Section 3.6.6. includes a summary of Haul Road and AWAR closures, which are applied in accordance with decision trees at Level 3. Table 55 references the use of decision trees. Appendix A provides wildlife observations and the corresponding mitigation action per TEMP Decision Trees. It is understood that the KivIA is asking for these to be reported in a new way with an assignment to whether they were applied as a Level 1, Level 2, or Level 3 mitigation action.*

Regarding April 1st, the presented data is erroneously presented in the Wildlife Summary Report. Speed restrictions were applied to allow trips in progress to be completed. Monitoring was performed in the afternoon. Weather forecast presented a blizzard arriving, and the decision was taken to close the road prior to the start of Day shift on April 2nd, as there are no hauling activities on night shift.

The KivIA's comment about the caribou GST is not related to the 2021 report but is more appropriately discussed with the TAG as part of on-going discussions on the GST approach and alternatives. Including mitigation for protection of leaders has been discussed previously at TAG meetings and would require a revision to the TEMP. If the group size of leaders is below the seasonal GST value, then mitigation associated with GST may not be triggered. However, as presented in the TAG#9 in September 2021, the concept of Lead GST was applied between April 5-7, 2021 on the AWAR and between April 14-16, 2021 on the WTHR. The GN's GST approach is designed around the idea that it provides protection of 75% of observed caribou. Table 10 of the 2021 report shows that the percent of caribou encountering either a closed AWAR or Haul Road are >75% during sensitive seasons.

4.3 Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report - Road Survey and Convoys

References: Appendix 46: S 3.6.5, 3.6.7



Comments: Use of convoys figures prominently in management of traffic disturbance on caribou (S 3.6.5 – 3.6.7, pg 3-13 – 3-14; TEMP V7: Figs. 6, 8). Details on the occurrence and makeup of the convoys used during road closures were provided, and showed that fuel tankers comprised 56% of the convoyed vehicles during road closures (Table 13, pg 3-17). Convoying of vehicles during caribou migration, especially large trucks, has the potential to deflect or delay caribou crossing during migration depending on number and spacing of convoys. Convoys are often used during road closures (Tables 9, 10, pg 3-14) yet there has been no reporting of the effectiveness of convoying, the duration that it takes the convoys to pass, the spacing between convoy disturbance events, or the duration of time since disturbance that caribou are more likely to cross.

Recommendation 3: Agnico Eagle should:

- 1) Report on the spacing, duration and timing of convoys on both the AWAR and WTHR;
- 2) Since fuel tankers comprise over half of the vehicles within convoys, develop a strategy to pre-emptively store sufficient fuel to reduce the requirement for fuel tankers to be on the roads during periods of high caribou presence; and
- 3) in collaboration with the Terrestrial Advisory Group (TAG), design and implement a pilot haul truck convoy program that could test patterns of timing of road closure and convoying to determine whether convoys of vehicles (including and without heavy equipment) both would impact caribou movements and optimal timing between convoys.

Agnico Eagle's Response:

- 1) *Agnico Eagle is working with the TAG on a caribou behaviour to convoy pilot project. Further details on convoy information regarding spacing, duration and timing will be added moving forward.*
- 2) *Agnico Eagle is in process of obtaining regulatory approval for the installation of a 3.3ML fuel tank at the Meadowbank Complex. Such a fuel tank would increase fuel autonomy between the Baker Lake Marshalling Facilities and the Meadowbank Complex by an estimated 10 days, when based on 2022 consumption data.*
- 3) *Agnico Eagle looks forward to collaborating with the TAG to implement such a pilot program.*

4.4 Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary - Report Road-Related Wildlife Mortality

References: Appendix 47:S 3.6.9. Road-related Wildlife Mortality

Comments: Table 17 (S 3.6.9, pg 3-26) is difficult to interpret as it displays 199 road-related caribou mortalities on AWAR between 2007 and 2013 – presumably these are errors?



KivIA notes that in 2021, 19 Arctic hares were killed during traffic collisions and most (68%) were from October to December (Table 16, S 3.6.9, pg 3-25). This is considerably higher than in previous years (small mammal category; Table 17). Agnico Eagle did not comment on the high number of deaths.

The number of live Arctic hares recorded during the road surveys was 60 and 8 for AWAR and WHTR, respectively, in 2021 (Table 7, S 3.6.4, pg 3-11) but which is difficult to compare to previous years as data are not provided. Even though Arctic hares are not a designated Valued Ecosystem Component, they are part of the tundra ecosystem and the number of traffic mortalities in 2021 was unusually high.

Recommendation 4: Agnico Eagle should:

- 1) Agnico Eagles should determine if the apparent caribou traffic mortalities reported in Table 17 are an error;
- 2) Agnico Eagle should also improve consistency in reporting sightings and mortalities; and
- 3) Agnico Eagle should comment on possible explanations when deaths exceed the longer-term average including whether more hares than average were seen in 2021.

Agnico Eagle's Response:

- 1) *The Road-related mortalities for caribou reported in Table 17 are incorrect. This mistake for caribou was also included in the 2020 annual report. The values were correctly reported in the 2019 annual report and the mistake was the failure to superscript the last digit of each value for corresponding table footnotes. The correct values for 2007 to 2013 are provided in Table 2.4-1 along with the corresponding footnotes included in the 2019 annual report.*

Table 2.4-1. Summary of Road-related Mortality Records for Caribou

Year	Caribou
2007	3 ¹
2008	10 ²
2009	1 ³
2010	1
2011	2 ³
2012	2 ⁴
2013	5

¹ Two confirmed road mortalities.

² Two apparent road mortalities.

³ Cause of mortality unconfirmed.

⁴ One cause of mortality unknown.



- 2) *Agnico Eagle will report sightings and mortalities in the 2022 report in a manner consistent with mortalities presented in the 2021 report.*
- 3) *Wildlife mortality data are collected incidentally and therefore cannot be directly compared across years. Arctic hare are not a VEC, and variation in recorded hare mortalities could be related to hare population fluctuations, changes in vehicle traffic, changes in visibility throughout the year, and inconsistencies in reporting hare mortalities. The number of hares observed each year is also collected incidentally and likely inconsistently, which would preclude providing a precise estimate of average long-term abundance. Of the 19 hare mortalities recorded in 2021, 7 were recorded during road surveys whereas 12 were recorded incidentally.*

4.5 Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report - Presentation of Caribou Responses to Mitigation

References: Appendix 47; S 3.6.8 Caribou Responses to Mitigation, Caribou Crossings; S 11

Comments: Road surveys and incidental sightings documented 6,000 caribou crossing the AWAR and WTHR (S 3.6.8, pg 3-20). The number of crossings observed were reported by km post (Table 14), and Figure 7 shows numbers observed by month. However, these data were not presented graphically, and are not related to road closure status, current traffic level, or direction that the caribou crossed. Section 11.1 (integrated caribou monitoring results; Table 54, pg 11-1) stated “The majority of mitigations resulted from observations made during road surveys. A total of 318 caribou observations from road surveys were tied to mitigations (Appendix A)”. Thus, it appears that the road surveys are integral for triggering changes in mitigation (broadly summarized in Table 9, S 3.6.6, pg 3-14), but the details are buried in Appendix A (Table A-1) and are not synthesized.

Recommendation 5: Agnico Eagle should summarize caribou crossings relative to road closure status, convoys, speed restrictions and crossing direction to enable assessment of the effectiveness of the monitoring and mitigation strategies.

Agnico Eagle’s Response: *Agnico Eagle will include a summary of caribou crossings relative to road closure/open status, convoys, and speed restrictions. The direction of crossing caribou will also be included. Agnico Eagle would like to highlight that the current monitoring programs are generally intended for caribou detection and implementation of mitigation measures, and not for caribou crossing monitoring. Collaboration with the TAG will be required to improve caribou crossing monitoring programs to allow detailed analysis.*



4.6 Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report - Caribou Collar Data

References: Appendix 47; S 6.0 Caribou satellite-collaring program

Comments: “Collar data were not available to complete the 2020 and 2021 analysis” (S 6.7, pg 6-3) and “Collar data were not available to complete the analysis at the time of reporting” (S 6.8, pg 6-3). This is the second annual report for the Meadowbank Complex where caribou collar data were not used in analysis, and assessment of mitigation effectiveness and accuracy of impact predictions. NIRB Project Certificate No.008 Condition 29 requires that the Proponent shall “conduct analyses of this data to quantify the zone of influence and associated effects of project components on caribou movement for a study area that includes the Whale Tail mine site, the haul road, the Meadowbank Gold Mine and its All-Weather Access Road” (Meadowbank Complex report, S 1, Table 1-1, pg 15). The same problem limits monitoring and mitigation at Agnico Eagle’s Meliadine mine: a commitment to enter a data share agreement was reiterated in the June 17, 2021 List of Commitments for the Meliadine Waterline Application (Commitment 17).

The KivIA is extremely disappointed that the Government of Nunavut (GN) and Agnico Eagle were unable to sign a data share agreement to enable the mine to evaluate collar movements relative to their mining operations. Action 2.3c of the Nunavut Caribou Strategy (2014) states that the GN will “Work with industry to make caribou information available for baseline studies and impact assessments”. These collar data are an important component of the multitude of data used to assess the effectiveness of monitoring and the accuracy of impact predictions.

Recommendation 6: Agnico Eagle and the Government of Nunavut Department of Environment should develop a long-term (for example, life of the mine) data share agreement to enable Agnico Eagle to conduct analysis of collar movements at broad and fine (individual collar trajectories) scales to aid in interpretation of monitoring and mitigation effectiveness at the Meadowbank Complex.

Agnico Eagle’s Response: *Agnico Eagle is working with the Government of Nunavut to develop a data sharing agreement that is appropriate for all parties involved and that is appropriate across all phases of mine development.*

4.7 Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report - Viewsheds versus Road Surveys

References: Appendix 47; S 7.0 Viewshed surveys; S 3.0 Road surveys; S 11.1 Integrated Results

Comments: Agnico Eagle switched to viewshed surveys from height of land (HOL) surveys in February 2020. The 12-13 viewshed locations are supposed to have longer range of view to provide an earlier ‘early



warning' of caribou approaching the WTHR. However, viewshed surveys provided almost no triggers for changes in mitigation since "no caribou groups exceeding GST were observed on viewshed surveys, therefore no mitigations were implemented directly as a result of these surveys" (S 11.1, Table 54, pg 11-1). It is unclear whether caribou were observed during viewshed surveys that were not detected during road surveys.

Viewshed surveys did observed caribou more frequently to the east due to increased surveys in the fall ("upstream" of movement), with average sighting distance 1,050 m (S 7.5, pg 7-3). While the road survey observations were well-mapped, how far out caribou were detected and from which direction during road surveys were not reported (S 3.6.3, pg 3-5). Although these data are presented in spreadsheet form in Appendix A, a synthesis of the road survey data would allow comparison of the effectiveness of viewshed and road surveys.

Recommendation 7: Agnico Eagle should synthesize the road survey results with respect to distance and direction that observations occurred relative to the viewshed data.

Agnico Eagle's Response: *Agnico Eagle will provide a comparison of viewshed and road survey results to the TAG.*

4.8 Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report - Remote Camera Program

References: Appendix 47; S 8.0 Remote camera program

Comments: IA thanks Agnico Eagle for following up on comments from the previous monitoring report and providing the 2019-2021 camera results for the WTHR. Over the 3 years, technical staff adjusted camera positioning to capture both road traffic and caribou interactions with the road (S 8.4.1, pg 8-1); 10 paired cameras were used in 2021.

The study only partially met its objectives to monitor caribou behavioural interactions with the WTHR and to adapt traffic mitigation. Only events when caribou were photographed on the road or on either side of the road were considered crossing events, which limited sample size (0 in 2019, 10 in 2020 and 3 in 2021). Presumably sample size was why the results did not include the behaviours, which were to be categorized as interpretations (calm, stressed) rather than behaviour (alert, bedded). The average time between crossing events and previous vehicle, including during road closures, was 23:09 hours, ranging from 2:30 to 85:10 hours. Metrics about detected caribou crossing events are listed in Table 46 (S 8.5, pg 8-9) but it is unclear whether the Time Since Vehicle was based on time-lapse images only or motion triggered images as well (S 8.4.2, pg 8.3).



Agnico Eagle concluded that the remote camera program is unlikely to contribute to adaptive management unless more cameras are deployed and they recommended discussion with the TAG (S 8.6, pg 8-9). However, KivIA notes that in contrast, the camera program at the Meliadine AWAR was successful at recording traffic and caribou crossings (2021 Meliadine annual report Appendix 28: 2021 Caribou Trail Camera Study).

Recommendation 8: KivIA recommends that Agnico Eagle bring forward a revised remote camera program design to TAG using their experience at Meliadine with remote cameras. A major objective of the study should be to document the time since vehicle for successful (and unsuccessful) crossing events.

Agnico Eagle's Response: *Agnico Eagle will discuss with the TAG to further review the current camera program, to document additional crossings event*

4.9 Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report - Blast Monitoring

References: Appendix 47; S 9.0 Blast monitoring

Comments: KivIA is concerned that the 2021 blast monitoring as part of the Meadowbank and Whale Tail soundscape is not using the most appropriate thresholds, and monitoring caribou behaviour may not be a practical approach.

Agnico Eagle measured ground vibration and air blast pressure at four distances during 139 blasts at Whale Tail pit in 2021. As thresholds for caribou are unknown, they used a 1990 human annoyance threshold which assume that the blast's vibration pressure would not annoy humans at distances greater than 900 m (S 9.5.2, pg 9-11). However, in the USA, gravel blasting¹ reaches ambient background noise at distances of 164 km which suggests caribou may be aware of blasting ground noise at greater distances than 900 m. Agnico Eagle also measured the blasting impact as 'noise' and the human annoyance threshold was approximately 1,900 m from the blast site (Appendix G, Table 52). KivIA notes that IQ and recent research suggests caribou can hear at a lower frequency range² than previously thought.

Caribou were observed on 36 times during 169 pre-blast surveys (Appendix G, Table 51); that relatively low sighting rate is consistent with incidental observations of caribou at Whale Tail (S 4.5.2, Table 21, pg 4-4). Caribou behaviour was monitoring during 14 blast days between 6 May 2021 and 22 October 2021 but only six groups had complete information and were exposed at distances 832 m to >3,600 m.

Project Certificate T&C 5 specified two noise monitoring sites along the haul road as well as four sites at the Whale Tail pit. Agnico Eagle reports on the noise levels for blasting at two pit sites and two sites along the WTHR (to measure noise attenuation). Agnico Eagle should reference whether haul truck noise was measured and whether two more noise monitoring sites will be added.



¹ Table 3.6.4. in U.S. Department of the Interior, Bureau of Land Management. 2019. Willow Master Development Plan. Draft Environmental Impact Statement. Volume 1. Downloaded from https://eplanning.blm.gov/public_projects/nepa/109410/20002247/250002672/Willow_MDP_DEIS_Vol_1_508-2019-08-23.pdf

² Perra, M., T. Brinkman, P. Scheifele, and S. Barcalow. 2022. Exploring Auditory Thresholds for Reindeer, Rangifer tarandus. Journal of Veterinary Behavior. doi: <https://doi.org/10.1016/j.jveb.2022.05.002>

Recommendation 9: Agnico Eagles should update the basis for the blasting thresholds and consider, with TAG input, an alternative approach to measuring caribou responses to blasting as part of the Meadowbank and Whale Tail soundscape.

Agnico Eagle's Response: As noted in the 2021 report, there are few if any guidelines intended to address sensory disturbance to wildlife from explosive blasting. Accordingly, the key objective of the blast monitoring program is to establish a site-specific relationship between charge mass, ground vibration (PPV), overpressure (PPL), and caribou behaviour. In particular, the monitoring program is aiming to determine PPV and PPL levels that may be disturbing to caribou, so this information can be used to inform site-specific caribou mitigation strategies.

In the absence of existing thresholds or limits for evaluating caribou disturbance, the 2021 report used guidelines for human annoyance as a starting point for assessment of potential impacts to caribou. In other words, the human annoyance limits were included to provide context to the PPV and PPL values presented in the report (i.e., to provide readers with a quantitative basis for conceptualizing PPV and PPL levels). As noted in KivIA's comments, analysis of blasting data collected between December 20, 2020 and August 6, 2021 suggested that human receptors located more than 900 m from the Whale Tail Pit are unlikely to be annoyed by ground vibration from even the largest blasts, and that human receptors located more than 1,900 m from the Whale Tail Pit are unlikely to be annoyed by overpressure from even the largest blasts.

Agnico Eagle acknowledges that scientific research on the caribou auditory system continues to evolve. Agnico Eagle also acknowledges that caribou may react differently to blasting PPV and PPL than human receptors, and data collected to date are not sufficient to establish a definitive relationship between caribou behaviour and PPV or PPL levels. For these reasons, Agnico Eagle is committed to continuing to record blast location, charge mass and depth and associated efforts to identify appropriate PPV and PPL thresholds for caribou disturbance. Agnico Eagle welcomes input and recommendations from TAG and other stakeholders on PPV and PPL levels that may be disturbing to caribou.



KivIA's comments refer to a Draft Environmental Impact Statement (EIS) prepared for the Willow Master Development Plan in Alaska, USA. Table 3.6.3 from this EIS predicts that noise from "gravel mine blasting" will attenuate to an assumed ambient background level of 35 A-weighted decibels (dBA) at a distance 101.9 miles (i.e., 164 km) from the blast site. The prediction presented in Table 3.6.3 from the EIS is based on a simplified calculation technique that assumes a reduction in noise levels of 6 dBA per doubling distance (e.g., if the noise level is 90 dBA at 1,000 feet from the source, it will decay to 84 dBA at 2,000 feet from the source, 78 dBA at 4,000 feet from the source, and so on). The 6 dBA per doubling distance approach is based entirely on geometric spreading and does not account for atmospheric absorption or ground interactions. As such, the 6 dBA per doubling distance approach tends to overestimate noise levels, especially for large propagation distances where atmospheric absorption and ground interactions can have a substantial effect (ISO 1996). Agnico Eagle believes that the site-specific blasting measurements and analysis presented in the 2021 report are more helpful to understanding blasting PPV and PPL at the Whale Tail site than the simplified modelling results presented in the EIS referenced by KivIA.

KivIA is correct that Agnico Eagle conducts regular noise monitoring at four locations around the Whale Tail Pit and two locations along the haul road, as required by NIRB Project Certificate No. 008 Condition 5. This monitoring does include noise from haul trucks. Results from this regular noise monitoring are reported by Agnico Eagle in their annual reports for the Meadowbank Complex.

Low numbers of caribou monitored have occurred because they are recorded opportunistically relative to blast events. Blasts occur approximately once per day and it is relatively rare that caribou are present when blasting occurs. Agnico Eagle will continue to collect caribou behaviour data opportunistically to inform on appropriate blast buffer thresholds.

References

ISO (International Organization for Standardization). 1996. ISO 9613-2 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation.

4.10 Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report - Caribou Migration Timing

References: Appendix 47; Appendix F Caribou Migration Timing Analysis (August 2021)

Comments: The objectives of the Caribou Migration Timing Analysis were 1) to determine whether timing of migration through the Mine area is predictable during spring and fall based on collar data, and 2) to explore relationships between collared caribou distribution and patterns in observed abundances of



caribou-based group sizes from ground counts (S 1.0, pg 2). The KivIA thanks Golder for addressing preliminary comments from the KivIA based on the March 2021 presentation on this analysis to the TAG. Collar data from Fall 2019 and onward were not available for analysis.

The methodology in the report is clearly laid out and the graphics are informative, especially the comparison of the road survey and collar information (Figures 5 and 8). The use of straight north-south reference lines to standardize the timing of migration for collars appears to result in comparison between collar timing and the timing of observations on the road to be out of alignment by up to 35 km in places. The implications of these different baselines for the comparison between collars and road observations are unclear.

KivIA does not agree that from the analysis, the annual timing of spring caribou migration through the Mine and roads area was relatively consistent (i.e., predictable) across years and that a proposed road closure cap of 18 consecutive days could be applied between April 21 to May 11 that would cover the mean migration timing for all but one year (S 4.0, pg 7). KivIA notes that 'mean migration' timing is not the most appropriate criteria as it is the beginning of migration that is important as well as the duration and the timing of the peak of migration.

The timing of fall migration is more variable than spring migration, although the duration of migration in either early or late fall was shorter than the duration of spring migration. However, combined early and late fall migration is longer. For fall, the report suggests that pulse mitigation (e.g., convoys) could be scheduled for approximately two weeks in September to maximize the number caribou exposed to roads without Mine-related traffic and while continuing to resupply the stockpile with ore for the mill. This means haul trucks would be in the convoys, which is currently not the case.

KivIA notes that the cap of 18 days is not covered in the Project Certificate and that further work is needed to analyze the road survey data as the collar sample size is overall too low to support a collar-only analysis. KivIA also recommends that a better understanding of 'pulse' (convoy management) is essential before it is implemented. Additionally, a more detailed understanding of 'cap' is also needed such as closure for the hours when caribou crossings are most likely based on the road surveys, remote cameras and behaviour monitoring.

Recommendation 10: Agnico Eagle should:

- 1) Clarify why a set buffer distance from the road itself can't be used as the reference line for collar movement;
- 2) Compare the dates of beginning and end of migration and duration from road surveys with the collar data;



- 3) Integrate the road survey and collar data once collar data from fall 2019 and onward are available to reassess these results; and
- 4) Ensure that the results and implications of this analysis are discussed at the next TAG meeting.

Agnico Eagle's Response:

- 1) *The Mine roads are not a straight north-south alignment and use of a distance buffer would mean that the timing between collared caribou intersecting with the buffer could be earlier or later simply on where the caribou intersected the buffer (e.g., north versus south). A distance buffer would also have to be large enough for all migrating collared caribou to intersect it. Otherwise, data from collared caribou that are not close to the Mine roads could be "missed" because their movement path never intersects the buffer (a distance buffer has curved ends). A larger buffer would likely result in earlier migration dates because it would be further west for spring migration and east for fall migration and be less relevant to the timing of interaction with the Mine roads. The straight north-south reference line used in Appendix F standardizes a continuous point (line) in space that all migration collared caribou encounter and its proximity to the Mine roads makes the intersection dates relevant to when the Mine roads might be encountered. A buffered distance reference line would be appropriate if the interest were only the dates when collared caribou were a specified distance from Mine roads. However, as noted previously collared caribou that do not interact with the distance buffer would not be represented in the sample of dates.*
- 2) *The first and last dates of road survey (ground observations) caribou observations and duration in 2018 and 2019 are shown graphically on Figure 5 (Panels A and B) for spring and Figure 8 (Panels A and B) for fall of Appendix F. Agnico Eagle will include the requested information in an updated assessment.*
- 3) *Agnico Eagle will update the assessment after the data sharing agreement with the GN is finalized.*
- 4) *Agnico Eagle will provide an updated assessment after a data sharing agreement with the GN is finalized. It is unknown at this time when the data sharing agreement will be finalized, so Agnico Eagle cannot commit that an updated assessment can be provided before the next TAG meeting.*

4.11 Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report - Caribou Harvest Distribution

References: Appendix 47; Appendix H Hunter Harvest Study (HHS);

Comments: During the Nunavut Wildlife Management Board study between 1996 and 2001, 18% of caribou harvests were estimated to be within 5 km of the AWAR and 7% within the Meadowbank Local Study Area (LSA; prior to construction; 6.2, pg 9). A threshold level of 20% was set for monitoring the



effects of the Meadowbank mine development on the distribution of harvested caribou. The 2021 HHS data indicated that 43% of reported harvest occurred within 5 km of the AWAR and 32% within the LSA (Table 6.1, pg 11). The 140% increase in harvest distribution within 5 km of the AWAR and the 350% increase within the LSA suggest that the distribution of harvesting has changed since the construction of the AWAR (Fig. 6.1, pg 10; although the 5 km buffer is not provided).

The threshold for the potential effects on hunting by Baker Lake residents is “The AWAR will not result in significant changes in the spatial distribution, seasonal pattern, or harvest levels of caribou by Baker Lake hunters. Changes will not exceed 20% of historical harvest activities within the RSA” (S 10.5, Table 53, pg 10-3). Although Table 53 indicates that the threshold was not exceeded in 2021, the distribution of the caribou harvest relative to the AWAR clearly indicate the threshold was exceeded.

Recommendation 11: Agnico Eagle should clarify why they believe that construction of the AWAR has not changed the spatial distribution of the caribou harvest compared to historical harvest activities.

Agnico Eagle’s Response: *Agnico Eagle believes that the changes in distribution and increasing harvest rates were anticipated given the vastly improved access for hunters in the snow-free periods. The threshold level was deliberately set at 20% for the Regional Study Area (RSA) and not the Local Study Area (LSA) to ensure that harvest rates on Caribou populations (i.e., individuals primarily from the Ahiak, Lorillard and Wager Bay herds) in the regional area were not significantly affected. This approach allows for a population-level assessment.*

In Table 6.1 of the 2021 Hunter Harvest Study and Creel Survey Summary Report presented Appendix 47 of the 2021 Annual Report, harvest rates within the RSA were 71% of total harvest compared to 67% from the historical study; thus, leading to the determination that threshold levels were not exceeded. This relatively small difference in hunting rates within the RSA indicates that prior to AWAR construction, areas north of Baker Lake (i.e., within the current RSA) were historically also the most important hunting areas for hunters. Thus, the general distribution of hunting has not changed dramatically on a regional level, even with construction of the AWAR.

Of note it is that 2021 hunting rates within the RSA were the third lowest since 2007, when data was first collected. Figure 2 of the 2021 Hunter Harvest Study and Creel Survey Summary Report clearly outlines the trends in hunting rates within the RSA.

4.12 Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report - Behaviour

References: Appendix 47, Appendix L Caribou Behaviour Monitoring



Comments: KivIA finds that the behaviour study (Appendix L) combining 2020 and 2021 data largely meets its objectives and contributes to describing impacts on caribou. Although more than half the bouts had between 1 and 6 disturbances (60% of the disturbances in 2020 and 2021 were heavy vehicles), the presentation of the frequency of disturbances could be clarified to summarize the proportion and type of disturbances relative to whether they occurred when the road was closed, open or speed restrictions were in place. Figure 6.3-7 (Appendix L, pg 21) shows a subset of 6 bouts of alert or running caribou, but the Appendix C (in Appendix L) with all bouts and the frequency of disturbances is hard to read. The study showed caribou return to their interrupted activity within 3-6 minutes of a disturbance, which indicates that it is the frequency of disturbances which will largely determine caribou impacts.

Sample size and the number of variables reduced detecting statistical significance. Sample size relative to seasons is biased toward spring migration as (Table 6.2-2) 114 surveys were during pre-calving migration compared to only 15 surveys in calving and summer and 5 surveys in fall migration in 2021. Low sample size in fall is a disadvantage as caribou are especially sensitive to interruptions in forage intake. Sample size to examine impacts of convoys was also too small (9 bouts; S 6.3.8, pg 19).

The behavioural study is not yet part of the overall monitoring (it is not included in Section 11.1, Integrated monitoring; Table 54, pg 11-2), although it is a TEMP v7 component. The behaviour studies can help assess mitigation effectiveness especially if integrated with road surveys, remote cameras and caribou collars.

Recommendation 12:

- 1) Agnico Eagle should provide TAG with an estimate of necessary sample size to increase statistical power including detecting caribou responses to convoys and other traffic mitigation strategies. The required sample sizes should guide TAG discussions on assessing mitigation effectiveness.
- 2) Agnico Eagle should work with TAG to determine how to integrate behaviour monitoring behaviour with collar data and road surveys to address road mitigation effectiveness. Additionally, TAG could advise on how the behaviour study should contribute to establishing a threshold for 'sensory disturbance'.

Agnico Eagle's Response: *Following discussions at the TAG in February 2022, for the 2022 field season, a goal of 50 surveys during fall has been put forward, including several more convoy surveys. This represents a substantial shift in the focus from opportunistic surveying, which favours spring surveys (when caribou are more concentrated and easier to survey). Instead, spring surveying in 2022 will be more heavily focused on increasing the number of convoy surveys. Last year, 9 convoys surveys were recorded, with only 4 of them complete enough to include in a statistical analysis. Though it is technically possible, an analysis on a sample size of 4 will not be processed. Following the 2022 field season, convoys will be explored as a variable. Ten complete surveys represent the targeted bare minimum sample size for attempting statistics. It should be noted that the survey goals reflect practical*



limits on the number of surveys that can be completed by the field technicians in the time available and with the frequency of caribou passing through. An accurate assessment of the number of surveys required to detect a response would require a power analysis, which is something may be investigated retroactively after the 2022 analysis if detecting caribou responses to convoys remains not possible.

Regarding the second comment from the KIA, once the collaring data sharing agreement is completed with the GN, Agnico Eagle looks forward to working with the TAG into merging both programs for further analysis.

4.13 Whale Tail Haul Road KVRW15F01 2022 Work Plan

References: Appendix 4; S 3

Comments: Section 3 (2022 planned activities) states “Widening of the road to 9.5m was completed in 2018. In 2022, road widening to 15m on specific sections of the Whale Tail Haul Road is planned to ensure safer driving condition for long-haul truck production and all other road users. The planned road sections to be widened are: KM116 to KM131, KM145 to KM154, and KM172 to KM179, however should additional needs be identified, other sections may be widened as well.”

NIRB Certificate No. 008, Condition 65 states that the Proponent shall consult with the TAG to develop a construction plan for widening the Whale Tail haul Road. In 2018 and 2019 there was much discussion at Terrestrial Advisory Group (TAG) meetings to develop caribou-friendly slopes to the road in specific areas, driven by caribou trails, collar data and IQ. The KivIA cannot recall that further discussions with TAG were held on this topic in 2020 and 2021. In responses to KivIA comments on the 2020 annual report, Agnico Eagle stated that a timeline for road widening has not yet been developed. The Appendix 4 states that widening of much of the haul road is planned for 2022, but the work plan does not provide design details.

Recommendation 13: As stated in Certificate No. 008, Condition 65, Agnico Eagle should provide a timeline and road designs for the widening of the Whale Tail Haul Road prior to construction.

Agnico Eagle’s Response: *There are no plans in place for widening the Whale Tail Haul Road to 15m in the near future. Should this change, Agnico Eagle will provide a timeline and road designs to the KivIA prior to construction. In 2022, for operational safety purposes, there are four areas along the Whale Tail Haul Road that were widen to 10m.*



4.14 Meadowbank Complex 2021 Annual Report – STP Chemistry

References: 2021 Annual Report; S 8.5.4.2, Agnico Eagle's response to Meadowbank (2AM - MEA1530) and Whale Tail (2AMWTP1830) 2020 Annual Report comments

Comments: In regards to phosphorus removal efficiency at the Whale Tail STP, Agnico Eagle commented that they would be switching to Re300 for greater effectivity. However, the 2021 Annual Report refers to refitting the treatment plant with larger lines for greater Alum dosing.

Recommendation 14: Please confirm if the switch to Re300 chemistry for the Whale Tail STP is still under consideration.

Agnico Eagle's Response: *At present, the Whale Tail STP is still using aluminium sulphate for the removal of phosphorus. The rationale for not changing reagents is that the plant was able to make modifications to the system to allow for increased Alum dosing. The plant is still open to switching to Re300 if maximum alum dosing is not effective enough to meet parameters*

4.15 Meadowbank Complex 2021 Annual Report and Appendix 33: Meadowbank and Whale Tail 2021 Core Receiving Environment Monitoring Program Report – Modelling of TP

References: 2021 Annual Report; S 8.12.4.3; Appendix 33 S 5.3 Water Chemistry

Comments: When referring to TP exceedances in MAM and WTS, Agnico Eagle States "The 2019 FEIS model predictions do not consider management activities that occurred on site in 2020 and 2021".

Recommendation 15: Please clarify whether revisions to the TP models are required to determine the extent and impact of phosphorus loads on the receiving environment.

Agnico Eagle's Response: *The FEIS model predictions provided in the revised FEIS Approved Expansion Project document were based on the proposed timeline for developing infrastructure on site (Golder, 2019). The proposed timeline used for the FEIS included when and how much water would be released to MAM and WTS. Any changes to the timing of development activities and other factors may have resulted in water quality predictions that differed from those predicted for years 2020 and 2021. As noted in the FEIS addendum, the FEIS predicted concentrations are order-of-magnitude estimates and actual water quality will depend largely on management practices followed during mining and on-site conditions (Golder, 2019).*



4.16 Meadowbank and Whale Tail 2021 Core Receiving Environment Monitoring Program Report – CREMP Activities

References: Appendix 33, S 5.3 Water Chemistry, S 7.2 Whale Tail

Comments: Nutrient loading continues to be observed through trigger exceedances at Whale Tail, Mammoth and A20, and lower under ice dissolved oxygen levels are observed at Mammoth and Whale Tail relative to control lakes.

Recommendation 16: The KivIA supports the CREMP recommendation that the full CREMP program is conducted at Whale Tail for 2022, including monthly through-ice limnology profiles at MAM, WTS, and NEM.

Agnico Eagle's Response: *Agnico Eagle acknowledges the KivIA's support on this matter. The CREMP report will be provided as part of the 2022 Annual Report. The 2022 CREMP report will provide details on the full CREMP conducted at Whale Tail, including monthly through-ice limnology profiles at MAM, WTS, and NEM.*

4.17 Meadowbank Complex 2021 Annual Report – Inconsistent Name Designations for the Whale Tail Project

References: 2021 Annual Report; S 1.0 Introduction, Pages 1 -3, 32-33, 37-38 (Tables 4 and 5)

Comments: There is not a consistent name designation for the Whale Tail Project. For example, this project is reference as the following:

Pages 1 to 3: "Amaruq satellite deposit", "Amaruq site", "Whale Tail Pit Project", Whale Tail Pit site", and the "Whale Tail Project".

Pages 32 and 33: "Whale Tail Project", "Amaruq underground project" and "Amaruq open pit",

Pages 37 and 38: Figures 4 and 5 both reference the "Whale Tail area".

Recommendation 17: The NIRB permitting process and any amendments always reference the "Whale Tail Project Certificate No. 008". The KivIA requests that this project be referenced as the "Whale Tail Project" in all future authorizations, annual reports, communication, documents, leases and permits. Any amendments should always refer to this project name as well. Any name(s) associated with an amendment to the NIRB certificate should be secondary to the project name. For example, the amendment related to the further development of the Whale Tail open pit, IVR open pit and Underground operations, which was approved on January 20th, 2020. Although not part of this review it is also recommended that the same approach be used for the NWB Type A Water License No. 2AMWTP1830.



Agnico Eagle's Response: *Agnico Eagle acknowledges the KivIA's comment on inconsistent naming designation and will, moving forward, refer to the location as the "Whale Tail Mine" as it is no longer a project being assessed. This convention will be implemented as part of the 2022 Annual Report internal review process to ensure alignment across all stakeholders involved in preparing the report.*

4.18 Whale Tail Haul Road KVRW15F01 2022 Work Plan – Widening of the Whale Tail Haul Road

References: Appendix 4; S 1.0 Introduction, Page 4; and S 3.0 2022 Planned Activities, page 8.

Comments:

S 1.0, page 4: "The sections that have been planned for road widening in 2022 from 9.5m to 15m are KM116 to KM131m KM145 to KM154 and KM172 to KM179, however should additional needs be identified, other sections may be widened as well."

S3.0, page 8: "The material used for road widening is planned to be extracted from CIRNAC Quarry 35."

Recommendation 18:

S 1.0, page 4: The KivIA requests should additional needs be identified and other sections are widened that this information be communicated to the KivIA with the location(s), source of the material(s) and a map of the haul road, such as Figure 1 in Appendix 4, page 5.

S 3.0, page 8: The KivIA requests that every effort be made to source the material(s) for the KM172 to KM179 section of road widening from sources(s) other than CIRNAC Quarry 35. This will reduce the traffic and generation of dust over the approximately 80km to 94km round trip from Quarry 35 to the section of haul rod from KM172 to KM179. The KivIA would suggest NAG waste rock from the Whale Tail WRSF and esker material from eskers 7, 7b and 7c.

Agnico Eagle's Response: *Agnico acknowledges KivIA's comments and should additional needs be identified pertaining to road widening on the Whale Tail Haul Road, will communicate with KivIA the location(s) and source of material(s) along with a map of the area as part of the next iteration of the KVRW15F01 Work Plan and in compliance with Project Certificate No. 008, Condition 65.*

Agnico Eagle will look to sourcing material from other locations other than Quarry 35 should logistics and operational constraints allow.



4.19 Meadowbank Complex 2021 Annual Report and Meadowbank 2021 Source Emission Survey Report – Stack Testing Dioxins and Furans Exceedance

References: 2021 Annual Report; S6.2.11 Stack Testing Activities, pages 119-120; Appendix 52, Summary, page 5.

Comments:

Summary, page 5: Dioxins and Furans Tests #3 and #4 exceeded the 80 pg/m dry @ 11% O₂ with values of 331.54 pg/m dry @ 11% O₂, 452.70 pg/m dry @ 11% O₂ and 286.01 pg/m dry @ 11% O₂,

S6.2.11 Stack Testing Activities, page 119-120: The following was recommended as follow-up to these exceedances:

- 1) Review of incinerators maintenance works performed in 2021 are ongoing.
- 2) Review of incinerator designs specifications are currently ongoing along with the review of potential impact from a change in the waste stream.
- 3) Agnico Eagle also requested external consultant to provide guidance on the potential causes of the exceedance – discussion will take place in April 2022.

Recommendation 19: The KivIA requests the following information once it becomes available:

- 1) Results of the review of incinerators maintenance works performed in 2021.
- 2) Results of the review of incinerator designs specifications.
- 3) Results of the review on the potential impact from a change in the waste stream.
- 4) Results of the external consultant's guidance on the potential causes of the exceedance.

Agnico Eagle's Response: *Agnico Eagle will provide to KivIA, once available, the conclusions of the investigation for the cause of the exceedances in dioxin and furan levels that occurred during the November 2021 stack tests.*

Agnico Eagle is looking into the possibility to suspend incinerator operations at the Meadowbank Complex. Suspension of use notifications were provided to NIRB and NWB.

5 Environment and Climate Change Canada (ECCC)

5.1 Stack Testing

References: 6.2.1.1 Stack Testing



Comment: Stack testing at the Meadowbank incinerator resumed in 2021. Logistical issues truncated testing in September. Stack testing was completed in November; however, results indicated application standards were exceeded for dioxins and furans for two of the tests as well as the overall average.

Recommendation 1: ECCC requests that the Proponent provide the conclusions, when available, of their investigation for the cause of the exceedances in dioxin and furan levels that occurred during the November 2021 stack tests.

ECCC recommends the Proponent provide a targeted time frame for 2022 stack testing. Given that freezing may have been a significant factor for the 2021 tests, ECCC recommends that the Proponent perform 2022 stack testing prior to the onset of freezing conditions.

Agnico Eagle's Response: *Agnico Eagle will provide to ECCC, once available, the conclusions of the investigation for the cause of the exceedances in dioxin and furan levels that occurred during the November 2021 stack tests.*

Agnico Eagle agrees with ECCC's recommendation of conducting the 2022 stack testing prior to freezing conditions and has tentatively scheduled the program for the end of August 2022. At this time, Agnico Eagle is looking into the possibility to suspend incinerator operations at the Meadowbank Complex. Suspension notification were provided to NIRB and NWB.

5.2 Bird Nests

References: Appendix 47 – Meadowbank and Whale Tail 2021 Wildlife Monitoring Summary Report

Comment: Section 4.5.3 states that an exemption permit from the Government of Nunavut was obtained to remove two nests of migratory birds – a passerine sp. and American robin, in 2021.

ECCC reminds the Proponent that it is illegal to disturb, destroy or take the nest or egg of a migratory bird, pursuant to Section 6 of the Migratory Birds Regulations, without a permit or authorization from ECCC.

Recommendation 2: ECCC recommends that:

- the Proponent conduct a thorough review of the notification procedures and protection measures for migratory birds outlined in their current Terrestrial Ecosystem Management Plan (TEMP), and revise as necessary to comply with the Migratory Birds Regulations; and
- the Proponent update ECCC's contact information in the TEMP for migratory bird interactions, incidents, and mortality notifications to cwsnorth-scfnord@ec.gc.ca.



Agnico Eagle's Response: *Agnico Eagle appreciates ECCC's reminder regarding the legal obligations pertaining to the removal nests or eggs of migratory birds and will ensure that the proper authorization for removal is obtained in the future from ECCC. The TEMP is currently under review and the next version will include notification and protection measures that are compliant with the Migratory Birds Regulations. This update to the TEMP will also include contact information for ECCC regarding migratory bird interactions, incidents, and mortality notifications.*

5.3 Shorebirds at the Tailings Storage Facility

References: Appendix 48 –Wildlife and HHRA Screening Level Risk Assessment Plan – Version 6; Appendix 46 – 2021 Wildlife and Country Foods Screening Level Risk Assessment; Terrestrial Ecosystem Management Plan

Comment: The 2021 results of the Wildlife and Country Foods Screening Level Risk Assessment report indicate exceedances (i.e. hazard quotients >1) for the shorebird receptor at the Tailings Storage Facility (TSF). The Proponent changed certain assumptions (e.g. exposure concentration, time-in-area, contribution of benthic invertebrates from the TSF in diet) resulting in a revised characterization of the risks for shorebirds at the TSF to negligible.

ECCC is concerned with the changes to these assumptions without more discussion and targeted studies. There is insufficient information about monitoring methods for bird use of the TSF in the TEMP and annual reports to support changes to the time-in-area assumption for shorebirds. ECCC is unable to determine, based on information provided, whether shorebirds are adequately being surveyed at the TSF, using a systematic approach and experienced observers. The more conservative approach is to assume birds are present and use the TSF for the majority of the breeding season and not just for eight days.

ECCC does not support the change in the contribution of benthic invertebrates from the TSF to the diet of shorebirds based on the measured average abundance of benthic invertebrates in the 2021 sediment samples (i.e. from 100% to 13%). The more conservative approach is to assume that 100% of the diet of shorebirds is coming from benthic invertebrates at the TSF. Not enough is known about how the availability of prey influences foraging and habitat selection of shorebirds on their breeding grounds.

Recommendation 3: ECCC recommends that a more conservative approach be used with the time-in-area and contribution of benthic invertebrates from the TSF in diet assumptions of the Wildlife Screening Risk Assessment Plan until targeted studies are conducted to refine site-specific conditions.

Agnico Eagle's Response: *According to ECCC's recommendation, Agnico has re-calculated hazard quotients for shorebirds (as represented by Semi-Palmated Sandpiper) who frequent the TSF location using the more conservative exposure assumptions of 1 month time-in-area and 100% of*



food as benthic invertebrates sourced from the TSF sediment during this time (Table 5.3-1). Agnico has also revised the WLSRA Plan assumptions to align with ECCC's recommendation and has provided this version as a standalone document alongside these responses. The use of average rather than maximum measured concentrations in tailings sediment and water was maintained here, since ECCC did not comment on this revised assumption. Similar to results of the assessment under standard exposure assumptions, hazard quotients for the arsenic, chromium, and cyanide exceeded the target value of 1 (Table 1), indicating a potential for non-negligible risk and a need for further assessment. To more accurately assess risk to shorebirds, Agnico proposes the following approach.

Step 1 – Analysis of COPCs in tailings beach sediment and re-calculation of hazard quotients.

As indicated in the uncertainty analysis, concentrations of COPCs in TSF solids were measured directly in mill effluent (following the same method used in the FEIS assessment of predicted impacts) rather than tailings beach sediment. This likely represents an overestimate of true exposure concentrations for some parameters (especially cyanide) since degradation over time in the TSF would be anticipated. Agnico proposes to collect and analyze a representative suite of samples of tailings sediment in areas potentially frequented by birds in order to confirm exposure concentrations. Samples will be collected between July - September, 2022, and a report with updated calculations provided to ECCC by December, 2022.

Step 2 – Follow-up discussion

Pending results of Step 1, Agnico will engage with ECCC to discuss next steps for potential targeted studies into shorebird use of the TSF, as needed. Agnico would aim to implement any follow-up studies determined in consultation with ECCC in spring/summer 2023.

Table 5.3-1 Revised Toxicity Reference Values and Hazard Quotients for Semi-Palmated Sandpiper (TSF Study Area) – Conservative Exposure Assumptions

Table 1: Revised Toxicity Reference Values and Hazard Quotients for Semi-Palmated Sandpiper (TSF Study Area) - Conservative Exposure Assumptions

Risk Assessment Parameter		% Intake from TSF	Antimony ^{2,3,4}	Arsenic ¹	Barium ¹	Beryllium ^{1,2}	Cadmium ¹	Chromium ^{1,5}	Cobalt ⁷	Copper ¹	Lead ¹	Manganese ¹	Total Hg	Inorg-Hg ^{1,9}	MeHg ^{1,9}	Molybdenum ¹	Nickel ¹	Selenium ¹	Strontium ^{1,2}
% Time-in-Area		8%																	
Dose (mg/kg wet/day)	Sediment	100%	0.0181	5.9000	0.9204	0.0045	0.0018	5.0504	0.2820	0.4519	0.4826	23.6000	0.0000	0.0000	0.0000	0.0081	3.6934	0.0042	0.5121
	Water	100%	0.0001	0.0001	0.0013	0.0006	0.0000	0.0003	0.0021	0.0445	0.0002	0.0040	0.0000	0.0000	0.0000	0.0007	0.0238	0.0007	0.0077
	Sedges	0%	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lichens	0%	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Berries	0%	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Invertebrates	100%	0.0612	18.0000	2.8080	0.0154	0.0062	6.6768	0.9560	0.4596	1.0307	80.0000	0.0000	0.0000	0.0000	0.0276	11.2680	0.0130	1.7360
	Total Food		0.0612	18.0000	2.8080	0.0154	0.0062	6.6768	0.9560	0.4596	1.0307	80.0000	0.0000	0.0000	0.0000	0.0276	11.2680	0.0130	1.7360
	Total Dose		0.079	23.900	3.730	0.021	0.008	11.727	1.240	0.956	1.513	103.604	0.000	0.000	0.000	0.036	14.985	0.018	2.256
TRVs (mg/kg wet/day)	NOAEL _{TRV}		9.8	2.5	21.0	0.1	1.5	1.0	2.4	47.0	1.1	977.0	na	0.5	0.0	3.5	77.4	0.4	26.3
	LOAEL _{TRV}		11.3	7.4	42.0	na	20.0	5.0	4.7	61.7	11.3	na	na	0.9	0.1	35.3	107.0	0.8	na
Hazard Quotients (unitless)	HQ (NOAEL)		0.0	9.7	0.2	0.3	0.0	11.7	0.5	0.0	1.3	0.1	na	0.0	0.0	0.0	0.2	0.0	0.1
	HQ (LOAEL)		0.0	3.2	0.1	na	0.0	2.3	0.3	0.0	0.1	na	na	0.0	0.0	0.0	0.1	0.0	na

Risk Assessment Parameter		% Intake from TSF	Thallium ^{1,6}	Tin ¹	Uranium ¹	Vanadium ¹	Zinc ¹	CN ⁸
% Time-in-Area		8%						
Dose (mg/kg wet/day)	Sediment	100%	0.0015	0.0142	0.0024	0.4720	0.3729	0.0401
	Water	100%	0.0000	0.0000	0.0001	0.0000	0.0001	0.0035
	Sedges	0%	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Lichens	0%	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Berries	0%	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Invertebrates	100%	0.0046	0.0480	0.0082	1.6000	0.7205	0.1224
	Total Food		0.0046	0.0480	0.0082	1.6000	0.7205	0.1224
	Total Dose		0.006	0.062	0.011	2.072	1.093	0.166
TRVs (mg/kg wet/day)	NOAEL _{TRV}		0.2	6.8	16.0	11.4	14.5	0.0
	LOAEL _{TRV}		0.8	16.9	na	na	130.9	na
Hazard Quotients (unitless)	HQ (NOAEL)		0.0	0.0	0.0	0.2	0.1	6.6
	HQ (LOAEL)		0.0	0.0	na	na	0.0	na

Notes:

na - not available

No allometric scaling for mammals (or birds) per Golder, 2019

underline corresponds to an unbounded LOAEL (10X safety factor used to derive the NOAEL) (see text for details)

na indicates that there was no TRV (NOAEL or LOAEL) available

¹ TRV from Sample et al. (1996)

² Bird TRVs calculated by multiplying the mammal TRVs with a safety factor of 0.1 (see WSLRA Plan for discussion)

³ NOAEL from Dieter et al. (1991) as quoted in Lynch et al. (1999)

⁴ LOAEL from Rossi et al. (1987)

⁵ Mammals TRV based on chromium VI; bird TRV based on chromium III (Sample, 1996)

⁶ TRV from Ueberschar et al. (1986)

⁷ Chetty et al. (1979) for mammal NOAEL TRV, Szakmary et al. (2001) for mammal LOAEL TRV, Van Vleet (1982) for bird TRVs.

⁸ Bird TRV from Ma and Pritsos (1997); uncertainty factor of 10 was applied to account for chronic exposure (Golder, 2004)

⁹ Assumed fractions of MeHg in soil = 0.01 x total Hg; MeHg in water = 0 x total Hg; MeHg in invertebrates = 0.17 x total Hg; InorgHg = Total - MeHg (see WSLRA Plan for details)



5.4 Predicted vs. Measured Water Quantity

References: Section 4.4.3.1 Meadowbank Site - Water Quality (report p. 74); Appendix 20 – Meadowbank Predicted Water Quantity & Quality

Comment: The comparisons to predicted water quality are presented in Appendix 20 for the various pit sumps and lakes. The tables start at Year 3, which appears to correspond to 2012, and go annually to Year 12, which would then be 2021. On the Year 12 table, measured data is included for 2012 to 2021, with comparisons of the mean and 25th percentile measured values to predicted values. In the various tables provided in Appendix 20, the comparisons for Probable Scenario and Possible Poor end Scenario appear to be done inconsistently between the various tables for the sites. The comparisons are made using different model year predictions (e.g. for the tables for Water Quality Year 12, North Portage uses Year 4 predictions; Goose Island Pit uses Year 3 predictions; Phaser Pit uses Year 10). Similarly, the preceding tables for Water Quality Years 3-11 use variable modeled years for comparison.

It is not clear why the predictions were not compared to previously modeled current-year concentrations, nor what actual years the model years correspond to.

For example, in the table titled “Vault Pit Sumps Water Quality Year 12” the columns for model comparisons are titled “Probable Scenario Year 10*” and “Possible Poor end Scenario Year 10*”. There is also a footnote stating, “*Used year 10 predictions for Vault which represent 3rd year of pit flooding, year 3 for Goose and year 4 for Portage which represent active pit operations as presented in Golder, 2007 - Water Quality Predictions Meadowbank Gold Project Doc No 516. Ver 0”. It is not clear in this example, which year the Year 10 predictions for Vault correspond to – perhaps 2019.

Comparisons to CCME guidelines and MDMER criteria are provided for measured parameters, using the dissolved fraction for metals. Total fractions (measured) should be compared to these guidelines and criteria, which are based on the total concentrations for metals.

Errata: In section 4.4.3.1 of the Annual Report (report p. 74) the description of comparisons for Phaser Pit states that dissolved barium is below the 20% difference with -5% and -17%. This should be cadmium, not barium.

Also in section 4.4.3.1 of the Annual Report, Figure 12 is missing 2014 data.

Recommendation 4: ECCC requests clarification on the timing as to what actual years the Water Quality Years and the Scenario Years correspond to, and the rationale for using the various scenario comparison years chosen rather than the most recent year available for predicted concentrations.

ECCC recommends that measured total metals be compared to the CCME guidelines and MDMER criteria.



ECCC recommends the Proponent update Figure 12 with the missing 2014 data and update the description of comparisons for Phaser Pit with the correct metal.

Agnico Eagle's Response: *The model year prediction in the original water quality forecast does not match the actual Life of Mine (LOM). For example, the Third Portage Pit (Pit E) was modelled to be mined from Predicted Year (PY) 1 to 4 but the actual LOM for this pit is from Actual Year (AY) 1 to 10. Thus, to compare the water quality in the pit sump as of AY5, the values forecast for PY4 was used. In the Model, as of PY5, the pit is undergoing pit filling. A table similar to the one below will be added in next year's report to summarize the difference between the Model Predicted Year and the Actual LOM Year.*

	MODEL YEAR PREDICTION		ACTUAL LIFE OF MINE	
	Active Pit Mining	Filling of Pit Lake (closure)	Active Pit Mining	Filling of Pit Lake (closure)
Third Portage Open Pit (Pit E)	1 to 4	5 to 13	1 to 10	n/a
North Portage Pit Sump (Pit A)	3 to 4	5 to 13	1 to 9	n/a
Goose Island Pit	2 to 3	5 to 13	3 to 6	n/a
Vault Pit Sump	5 to 7	8 to 13	5 to 9	as of year 10

In addition, it will be investigated if measured total metals can be compared to the CCME guidelines and MDMER criteria for next year's work. Lastly, Figure 12 of the 2021 Annual Report will be updated and the Phaser Pit comparison mentioned above will be corrected. The comments received from ECCC on the water quality forecasting will be addressed in the upcoming 2022 annual report.

5.5 Closure Pit Water

References: Section 9.1.1.1 Closure: Mine Site; Appendix 12 – Meadowbank Water Management Plan; (Section 3.4 Pit Flooding – Closure Concept; Appendix C. Page 62 Bullet iv.)

Comment: Section 3.4 of the Meadowbank Water Management Plan describes the reflooding of the Portage and Goose pits as follows (pdf page 35):



The reflooding concept of the Portage and Goose area includes water from tailings deposition activity, passive flooding, water transfers from the pit, water treatment, and active flooding from Third Portage Lake. More details on the treatment strategy including the discharge location and assimilative capability of the receiver is required to advance the Portage Area flooding concept.

In the 2021 Annual Report section 9.1.1.1 (pdf page 527), the Proponent described activities including: “Started environmental studies to assess the assimilative capacity of Third Portage Lake. The results from these studies will help define the allowable annual discharge volume and treated effluent requirements.”

The modeling update in Appendix C of the Meadowbank Water Management Plan states that “It is important to note that the treated effluent discharge water quality criteria shall need to be assessed based on the assimilative capacity of the receiving water body, Third Portage Lake.”

The proposed closure strategy is to treat and discharge the water in the pits, prior to capping tailings and reflooding. The approach of defining assimilative capacity implies a “pollute up to” approach, which is not compatible with maintaining the pristine water quality in the lakes.

ECCC notes that the closure commitment from the Proponent is to ensure pit water quality either meets background, meets the Canadian Council of Ministers of the Environment (CCME) guidelines for the protection of aquatic life, or meets appropriate site-specific objectives prior to reconnecting the pits to surface waters. Water quality in Third Portage Lake should be held at the same or better standards up to and beyond closure.

ECCC acknowledges that a detailed understanding of conditions in Third Portage Lake is needed to develop protective site-specific water quality objectives for closure, noting that these objectives should not be set to incorporate higher loadings and increases in concentrations of contaminants.

Recommendation 5: ECCC recommends that the work planned for understanding conditions in receiving water bodies be described such that the focus is not on quantifying levels of contaminants that can be discharged, noting that the objective is to maintain baseline or guideline/protective water quality in the lakes.

Agnico Eagle’s Response: *Agnico acknowledges ECCC’s comment and agrees that the main objective of the water quality assessment for Third Portage Lake is to understand the conditions of the lake in order to develop protective site-specific water quality objectives for closure. The assimilative capacity of Third Portage Lake will be assessed with the objective of maintaining baseline or guideline/protective water quality in the lake, rather than quantifying levels of contaminants that could be discharged from a treated effluent.*



5.6 2021 Water Management Plan Water Balance Tables

References: Appendix 12 – Meadowbank Water Management Plan (Appendix A – 2021 Water Balance Update; Appendix B – Water Management Schematic Flow Sheets)

Comment: The first table showing water flows and volumes for Third Portage Lake, Reclaim Tailings Water, and the Mill presents water quantity amounts over time. In 2026, Mill Fresh Water Volumes and Mill Process Water Volumes (pdf page 24-25) are negative, the reason for which is not clear given that these are not water reservoirs with capacity to be withdrawn.

The table starting on pdf page 61 includes a column for Tear Drop Lake to SC, but there are no volumes associated with this. It is not clear if these volumes are included in Pit A inputs.

The Water Balance Update would benefit from descriptive text in the Appendix to indicate what the highlighted cells and rows signify. Numbering of the tables would be useful.

ECCC also notes that the schematics provided in Appendix B were very helpful in showing the planned water management and changes over time. It would also be useful to include the post-reconnection schematic showing flows from Goose Pit and Portage pits and whether the pits are anticipated to be groundwater sinks (recharges).

Recommendation 6: ECCC requests:

- clarification of the 2026 water balance volumes associated with the mill and Tear Drop Lake;
- clarification of the significance of highlighted cells and rows in the tables; and
- provision of post-closure flow schematics.

Agnico Eagle's Response: *The negative 2026 water balance volumes associated with the mill are a formula error (which is why they correspond exactly with the monthly camp water volumes) and they should be zero; this will be fixed in the next edition of the water balance. The water balance column for Tear Drop Lake to South Cell has no volumes since this transfer is included with the Central Dike downstream pond inputs which are then sent to Pit A. Highlighted cells in the water balance usually signify volumes that are under discussion or investigation by the water and tailings engineers (for example perhaps the formulas include an error, or the volumes are suspected to be incorrect) and highlighted rows generally signify closure milestones. For the next edition of the water balance the highlighted cells and rows will be explained. Numbering of the tables will also be investigated for the next edition of the water balance; it is a challenge to present such a complex spreadsheet properly and this is something Agnico is working on. Agnico is pleased to hear the schematics provided in Appendix B were very helpful in showing the planned water management and changes over time; post-closure flow schematics can be provided in the next edition of the annual report.*



5.7 Aluminum Guidelines

References: Appendix 12 – Meadowbank Water Management Plan, Appendix C, Table 2-2: Discharge Criteria and CCME Guidelines for the Parameters Evaluated

Comment: Table 2-2 presents the aluminium guideline from CCME dated 1987. In June 2021, the Federal Environmental Quality Guidelines for Aluminium were released; these guidelines incorporate several toxicity modifying factors (Dissolved Organic Carbon [DOC], hardness, and pH) to effectively calculate a site-specific guideline. The Federal Water Quality Guideline (FWQG) equation is valid between hardness 10 and 430 mg/L, pH 6 and 8.7, and DOC 0.08 and 12.3 mg/L. The guideline is available at <https://www.canada.ca/content/dam/eccc/documents/pdf/pded/fegg-aluminium/Federal-environmental-quality-guidelines-aluminium.pdf>

Recommendation 7: ECCC recommends use of the updated FWQG for aluminium.

Agnico Eagle's Response: *Agnico will ensure the aluminum guideline is updated for next year's Water Quality Forecasting.*

5.8 Graphs

References: Appendix 12 – Meadowbank Water Management Plan, Appendix C, Figure 2-1: Concentrations North and South Cell TSF Reclaim Ponds – Total Cyanide & Metals

Comment: The legends on the various figures include a green line for the “Water Licence Limit” as a useful point of reference for concentrations. However, it is not shown on the graphs for cyanide, arsenic, and lead on Figure 2-1. Figure 2-4 is also missing the water licence limit line on the graphs for these parameters.

ECCC notes that the plotting of the previous year forecast is useful in providing indication of how closely current concentrations are tracking forecast levels.

Recommendation 8: ECCC recommends that figures in future report iterations include the water licence limit as a reference point on the graphs where missing for cyanide, arsenic and lead.

Agnico Eagle's Response: *Agnico will ensure in future report iterations that the water licence limit is added to the graphs where it is missing.*

5.9 Modeling Contaminant Contributions from Pore Water

References: Appendix 12 – Meadowbank Water Management Plan Appendix C (Section 2.7.3 Water Quality Table 2-7: Water Quality in Central Dike D/S Pond for 2020; Section 3.4 Input Parameters; Section 6.2 Recommendations)



Comment: The discussion of the water quality results in Table 2-7 suggests that the source of elevated ammonia, chloride, sulphate and fluoride in the Central Dike Downstream Pond could be from pore water in the tailings moving toward the pond. The pits receiving tailings (Goose Pit and Portage Pit E) will similarly have pore water that is high in contaminants. This pore water will be expressed upwards, as tailings are deposited and consolidate. Contaminant loadings from tailings have been reviewed using various approaches. Shake Flask Extraction tests were done in 2021 on ores from Vault, Portage and Whale Tail pits to quantify loadings from leaching of the tailings, to include as model inputs, although this assumed Total Dissolved Solids (TDS), chloride and cyanide were negligible. Mill effluent has been used as an (adjusted) model input and includes ammonia, chloride, sulphate and TDS; however, pit pore water in the tailings has not been explicitly incorporated, and it is not clear to what degree these steps will account for the pore water contributions to the overlying pit waters.

The recommendation is made in the Water Quality Forecasting Update (Section 6.2) to regularly monitor pit water quality in Portage and Goose pits, for use in modeling the pit water quality. ECCC notes that if possible, sample collection should be done at various levels in the water column to identify any difference associated with density stratification or upwelling pore water contributions.

Note that the title for Table 2-7 should refer to 2021 rather than 2020.

Recommendation 9: ECCC requests clarification regarding how pore water quality in the pits has been accounted for in the modeling update.

ECCC supports the recommendation in Section 6.2 to regularly analyse pit water quality, and recommends that various depths be monitored, including near the tailings/water interface.

Agnico Eagle's Response: *Pore water quality in the pits was not explicitly accounted for in the water quality modelling update as this is an item that Agnico has little data on due to the technical difficulties, including safety limitations, of sampling water from areas other than at the waters edge along pit ramps. However, a sampling program planned for summer 2022 will target to sample pit water from various depths within the pits including near the tailings/water interface, according to technical and safety limitations. Tailings pore water sampling is also planned and should be completed during this program. The results of the sampling program will be presented in the 2022 Meadowbank Annual Report.*

5.10 Elevated Arsenic and Chloride at Pit-E; Elevated Copper at Pit-A East – Seepage Monitoring

References: Appendix 42 – Meadowbank 2020 Groundwater Monitoring Report, Section 6 – Conclusions; Section 7 – Recommendations



Comment: The 2021 Meadowbank Groundwater Monitoring Report notes that seepage from the west wall of Pit-E continues to contain elevated concentrations of arsenic and chloride, and trace levels of cyanide indicating some TSF contributions. Waste rock contact water contributions may also be a factor. Arsenic, calcium, copper, manganese, potassium, sodium and sulphate at MW-16-01 are trending upward and are attributed to reclaim water from the South Cell TSF. There was also elevated copper in the Pit-A East wall seepage, and the source of that is unknown.

Section 7 notes that there should be detailed surveys of water levels to document hydraulic gradients influencing the movement of reclaim water, which is contained in various sites (e.g. Pit-A, Pit-E, Goose Pit, Central Dike ST-S-5) noting that the movement of reclaim water across the site will vary as water levels in the in-pit tailings deposition (IPD) pits increase. The recommendation is made to use isotopic signatures of groundwater affected by reclaim water to identify the source of arsenic in Pit-E waste wall seepage samples. It is not clear whether this can be done with analysis of current samples from the wall seepage, or if it will be necessary to collect wall seepage samples in 2022. Given the rising water levels in Pit-A and Pit-E re: safety concerns, the report notes it may not be possible to collect future pit wall seepage samples.

Recommendation 10: ECCC recommends that the Proponent identify alternative investigations for the source of the elevated arsenic and chloride concentrations at Pit-E Seepage location and copper at Pit-A east if needed wall seepage samples cannot be collected.

Agnico Eagle's Response: *In 2022, it will be unlikely that wall seepage samples will be collected for safety reasons. Agnico will collect water for stable isotope analysis, deuterium and oxygen-18, from known locations affected by the movement of the reclaim water as well as from sources that are affected by waste rock only contact water to identify the potential source of contaminants observed in the Pit wall seepage samples. This additional sampling will be performed during the bi-annually sampling to be performed in July and September. Results of this analysis will be reported in the 2022 annual report along with any further recommendations that are to be determined based on the supplemental data.*

5.11 QA/QC Plan

References: Appendix 54 – Meadowbank and Whale Tail Quality Assurance/Quality Control (QA/QC) Plan, Version 7, Table 2-2; Agnico Eagle's response to Meadowbank (2AM - MEA1530) and Whale Tail (2AM - WTP1830) 2020 Annual Report comments (dated Nov. 19, 2021)

Comment: In response to ECCC's 2020 Annual Report recommendations to update QA/QC sampling frequencies outlined in Table 2.2, the Proponent has outlined that the numbers of QA/QC samples are above the 10% minimum threshold. However, the frequencies currently listed in Table 2.2 still do not



reflect sufficient numbers for mine facilities and groundwater chemistry, nor do they all include trip blanks. The Proponent's response indicates that they are in fact collecting sufficient numbers of samples and of appropriate types (trip/field /duplicate) but ECCC notes that the frequency in Table 2-2 contradicts stated practices.

Recommendation 11: ECCC recommends that the Proponent update Table 2-2 of the QA/QC Plan to reflect the current practices and confirm that the minimum frequency of 10% is met for groundwater samples and mine facilities samples.

Agnico Eagle's Response: *Agnico Eagle will update Table 2-2 of the QA/QC Plan for the 2022 Annual Report to reflect the current practices for duplicate, field blank, and trip blank collection for groundwater and mine facilities sampling. Section 8.5.7 of the 2021 Annual Report includes information on the QA/QC of Meadowbank and Whale Tail mine facilities sampling, for which the minimum frequency of 10% for duplicates, field blanks, and trip blanks was achieved. As outlined in Appendix 42 of the 2021 Annual Report, the QA/QC requirements were met for the Meadowbank groundwater sampling program. The duplicate and trip blank QA/QC requirements were met for the Whale Tail groundwater sampling program, as described in Appendix 43 of the 2021 Annual Report, however the field blank that was planned for collection was not completed as result of a large-scale power outage that prematurely ended the field program. Agnico Eagle will include the QA/QC information for groundwater sampling as part of the main document of the 2022 Annual Report.*

6 Transport Canada (TC)

6.1 Marine Safety and Security

6.1.1 Information Regarding the Oil Pollution Emergency Plan (OPEP) and Oil Pollution Prevention Plan (OPPP for the Project

References: NA

Comment: For the information of the Board and the Proponent, under section 12 of the Environmental Response Regulations passed pursuant to CSA 2001, there is a requirement for the owner of an OHF to complete annual reviews and if necessary update the Project's Oil Pollution Emergency Plan (OPEP) and Oil Pollution Prevention Plan (OPPP). If plans are updated, they must be submitted to Transport Canada no later than one year after the update. As required under the CSA 2001, the facility will need to notify Transport Canada of proposed changes to the OHF's operations relating to the loading or unloading of oil to or from vessels (180 days in advance of the change). The facility is also required to submit a revised OPEP/OPPP 90 days before a change in operation.



Recommendation: Transport Canada recommends to the Board and the Proponent that an up-to-date OPEP/OPPP continue to be included in future annual reports for the Meadowbank Complex.

Agnico Eagle's Response: *Agnico Eagle acknowledges Transport Canada's comment and will continue to include the most up to date OPEP/OPPP as part of future annual reports.*

6.1.2 Additional Information – Marine Safety and Security

References: NA

Comment: Transport Canada would like to remind the Proponent of two particular pieces of information regarding marine safety and security:

- Before the facility interfaces with a foreign flagged vessel or a Canadian flagged vessel on an international voyage, AEM is required to comply with the Marine Transportation Security Act and Regulations.
- Marine shipping standard operating procedure: Vessel operators serving the Project should be made aware of the 2022 Annual Notice to Mariners, and in particular section A2 Marine Mammal Guidelines and Marine Protected Areas and section 7A Voyage Planning for Vessels Intending to Navigate in Canada's Northern Waters (see: Annual Notice to Mariners <https://www.notmar.gc.ca/publications/annual/annual-notices-to-mariners-eng.pdf>)

Agnico Eagle's Response: *Agnico Eagle appreciates Transport Canada's reminders regarding marine safety and security and will forward this information to the shipping companies Group Desgagné's and Woodward to ensure that all applicable regulations are being followed.*

6.2 Transportation of Dangerous Goods – Future TDG Documentation

References: NA

Comment: The Meadowbank Complex 2021 Annual Report lists the items which were shipped out from the complex as dangerous goods/wastes, which included aerosol cans, automotive batteries, diesel fuel, gasoline and paints and paint related material. However, the 2021 Annual Report did not include the shipping documents for the shipment of dangerous goods/wastes from the Meadowbank Complex.

Recommendation: Future annual reports for the Meadowbank Complex include copies of all TDG documentation for the Project, including hazardous waste manifests. This information would support Transport Canada's reviews of future annual reports for the Project.

Agnico Eagle's Response: *Agnico Eagle has listed the quantities of hazardous waste that has been shipped off site for disposal in Table 6-3 of the 2021 Annual Report, however the associated*



hazardous and non-hazardous waste manifests can be found in Appendix 26 of the 2021 Annual Report.