Canadian Northern Economic Development Agency
Agence canadienne de développement économique du Nord
1106 Allavvik Building
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April 12, 2020

Karen D. Costello
Executive Director
Nunavut Impact Review Board
P.O. Box 1360
Cambridge Bay, NU X0B 0C0

Via e-mail: info@nirb.ca

Re: Government of Canada Final Written Submissions for Agnico Eagle Mines Limited's "Saline Effluent Discharge to the Marine Environment" Project Proposal

Dear Ms. Costello,

As requested within the Nunavut Impact Review Board's (the NIRB) Notice of Public Hearing, issued on March 11, 2021 for Agnico Eagle Mines Limited's (AEM) "Saline Effluent Discharge to the Marine Environment" Project Proposal (the Project), the Government of Canada would like to provide Final Written Submissions (FWS) from departments participating in the NIRB's reconsideration process.

The Northern Projects Management Office (NPMO) submits the following on behalf of Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), Fisheries and Oceans Canada (DFO), Environment and Climate Change Canada (ECCC), Health Canada (HC), Natural Resources Canada (NRCan), and Transport Canada (TC).

The Government of Canada looks forward to continued participation in the Board's reconsideration process. If you have any questions or concerns, please contact Saba Qazi, Senior Project Manager, NPMO, at saba.qazi@canada.ca, (867) 975-1945.

Sincerely,

Adrian Paradis
A/Director General
Northern Projects Management Office

c. Krista Henriksen, Regional Director General, Crown-Indigenous Relations and Northern Affairs Canada

Tom Hoggarth, Director General, Ecosystems Management Fisheries and Oceans Canada, Central and Arctic Region

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Mary Taylor, Director General Environmental Protection Operations Directorate, Environment and Climate Change Canada

Chantal Roberge, Director Environmental Health and Internationally Protected Persons, Health Canada

Rinaldo Jeanty, Director General, Explosives, Safety and Security Branch, Natural Resources Canada

Shari Currie, Regional Director General, Prairie and Northern Region, Transport Canada

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Abbreviations

AEM:	Agnico Eagle Mines Limited
ARD:	Acid Rock Drainage
AWAR:	All-Weather Access Road
CEPA:	Canadian Environmental Protection Act
CIRNAC:	Crown-Indigenous Relations and Northern Affairs Canada
CNWA:	Canadian Navigable Waters Act
COPCs:	Chemicals of Potential Concern
DAS:	Disposal at Sea
DFO:	Fisheries and Oceans Canada
ECCC:	Environment and Climate Change Canada
FA:	Fisheries Act
FFHPP:	Fish and Fish Habitat Protection Program
FEIS:	Final Environmental Impact Statement
FWS:	Final Written Submission
HADD:	Harmful Alteration, Disruption, or Destruction of Fish Habitat
HC:	Health Canada
HDD:	Horizontal Directional Drilling
HHRA:	Human Health Risk Assessment
ICRP:	Interim Closure and Reclamation Plan
IR:	Information Request
KIA:	Kivalliq Inuit Association
KWB:	Kivalliq Wildlife Board
MBCA:	Migratory Birds Convention Act
MDMER:	Metal and Diamond Mining Effluent Regulations
NIRB:	Nunavut Impact Review Board
NPMO:	Northern Projects Management Office
NuPPAA:	Nunavut Planning and Project Assessment Act
NWB:	Nunavut Water Board
ODMP:	Ocean Discharge Monitoring Plan
PCA:	Parks Canada Agency
the Project:	Saline Effluent Discharge to Marine Environment Project Proposal
RFR:	Request for Review
SARA:	Species at Risk Act
SETP:	Saline Effluent Treatment Plant
SWTP:	Saline Water Treatment Plant
TDS:	Total Dissolved Solids
TC:	Transport Canada
TRC:	Technical Review Comment
TSS:	Total Suspended Solids

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Introduction

On March 18, 2020, the NIRB received an application from AEM to modify operations of the Meliadine Gold Mine Project Certificate 006, Amendment 001. The Application proposes changes to the scale and scope of activities related to components of the Meliadine Gold Mine associated with the management of treated saline groundwater effluent.

The scope of the Project includes the development and operation of a waterline system along the all-weather access road (AWAR) and by-pass road to convey treated saline groundwater effluent from the Meliadine Gold Mine site to the existing marine discharge facility at Rankin Inlet's Itivia Harbour, in lieu of the currently approved trucking method.

This infrastructure would remain in place for the life of the mine, and involves the following works or activities:

- Construction and operation of a waterline from the Meliadine mine site to the Itivia facility along the AWAR and by-pass road, specifically:
    - Installation of two waterlines of 16 inch diameter, running alongside the existing roads and within the easement of the existing roads;
    - Connection of the waterlines to a modified pump house/sampling station at the Itivia Harbour facility.
- Installation, operation and decommissioning of a new outfall extending from the pump house at the existing Itivia facility to a discharge location in Melvin Bay, including:
    - discharge location approximately 250 m northwest of the existing approved pipeline;
    - use of horizontal directional drilling (HDD) method to construct an underground corridor for the pipeline;
    - outfall extending underground from the pump house to approximately seven meters below the water surface, and continue on the sea floor to an engineered diffuser at 20 m depth; and
    - the outfall would remain in place following decommissioning of the facility.
- Discharge of saline effluent into Melvin Bay at a rate of 6,000 m^3 to 12,000 m^3 per day during the open water season.

During the Information Requests (IRs) phase, the NIRB circulated additional information regarding the finalized scope of the Project, a summarized below.

- Approximately 80 to 90 percent of the waterline's length would be covered, with remainder above ground.
- There is an alternative option to divert on-site treated surface contact water for discharge to the marine environment via the waterlines to reduce the volume of contact water being discharged to Meliadine Lake. If the alternative is required, the maximum volume of surface contact water that would be discharged to Melvin Bay would be 8,000 m^3 per day, for a total maximum volume of 20,000 m^3 per day.

If approved, construction of the infrastructure is proposed to begin in summer 2021. Infrastructure would remain in place for the life of the Meliadine Gold Mine and will be dismantled and removed at the end of activities related to ocean discharge.

The Government of Canada has participated throughout the NIRB's assessment of the Project with the objective of providing information about potential impacts to assist the NIRB in making an informed recommendation. Through the submission of IRs, Technical Review Comments (TRCs), and participation at the January 2021 Technical Meetings and the February 2021 Community

Roundtable and Pre-Hearing Conference, CIRNAC, DFO, ECCC, HC, and TC have posed questions, concerns, and recommendations to AEM on issues pertaining to their respective mandates in an effort to identify opportunities for resolution. NRCan did not complete a technical review of the Project as the department did not identify technical issues of concern relevant to its areas of expertise. However, departmental representatives from NRCan have been present and available throughout the NIRB's assessment process to respond to questions and concerns pertaining to NRCan's regulatory role and previous assessments of the Meliadine Gold Mine.

The following submissions provided by participating departments offer a brief overview of the issues identified throughout the assessment, with the intent to indicate their current status, actions taken by AEM to achieve resolution to a degree considered satisfactory by the department (where applicable), and recommendations or requests that departments would like to put forward for the NIRB's consideration.

Crown-Indigenous Relations and Northern Affairs Canada

Executive Summary

CIRNAC has undertaken a review of the Final Environmental Impact Statement (FEIS) Addendum submitted by AEM to the NIRB in support of its Application for the Project. The scope of the Project includes the construction and operation of a waterline system to transport treated saline groundwater effluent from the mine site to Itivia Harbour and discharge to Melvin Bay at Rankin Inlet, Nunavut. The proposal is being assessed by the NIRB as a reconsideration process and potential amendment to the Meliadine Gold Mine Project Certificate 006, Amendment 001.

CIRNAC's review process consisted of the assessment of biophysical and socio-economic aspects of the Project under its mandate and areas of jurisdiction. This included participation in NIRB information session, IRs and TRC submissions, both of which received responses from AEM. In addition, CIRNAC participated in several formal NIRB meetings which included Technical Meetings, a Community Roundtable and a Pre-hearing Conference.

CIRNAC's review of the Project resulted in 10 TRCs with relevant recommendations for consideration by the NIRB and AEM. Following AEM's responses to TRCs, CIRNAC had two bilateral meetings with AEM with the view to resolve the outstanding issues. Upon receiving additional information from AEM, six of the TRCs were resolved completely and four were resolved with commitments from AEM. All 10 TRCs with their current status are described in detail in Section 2 of this report and summarized below:

- **CIRNAC-TRC #1**: CIRNAC required additional clarification from AEM regarding their statements that inflows of saline groundwater to the underground mine are now anticipated to be greater than previously predicted. This issue is resolved based on AEM's commitment to updating the Groundwater Management Plan to clarify discrepancies between the 2014 FEIS groundwater inflow predictions and the 2020 FEIS Addendum;
- **CIRNAC-TRC #2**: CIRNAC required further clarification regarding the extent to which surface contact water from the mine site would be conveyed by the two proposed waterlines for discharge to Melvin Bay. This issue is resolved based on additional information that AEM provided and their commitment to updating the Groundwater Management Plan to provide further details on the activity of mixing and treating various contact water sources;
- **CIRNAC-TRC #3**: CIRNAC required further information regarding contingencies that AEM would put in place in order to deal with situations that might lead to sub-standard

performance of the Saline Effluent Treatment Plant (SETP). This is resolved based on the additional information AEM provided and the commitment AEM made to updating the Water Management Plan to include multiple options for the management of the increased volume of sludge;

- **CIRNAC-TRC #4**: CIRNAC required additional clarification as to how AEM would conduct conformity checks of treated effluent prior to discharge to Melvin Bay via the proposed waterlines. AEM provided adequate information regarding management steps and monitoring overview to prevent potential non-compliance. Based on additional information AEM provided, the issue is resolved;
- **CIRNAC-TRC #5**: CIRNAC required an updated Water Quality and Load Balance model to reflect the altered site water management plan in terms of treating both surface contact water and saline groundwater by the SETP, conveyance through the waterlines and discharge to Melvin Bay. AEM submitted the requested information and the issue is resolved;
- **CIRNAC-TRC #6**: CIRNAC required the completion of a detailed assessment of waterline failure modes and potential effects by AEM to address uncertainty associated with the potential environmental consequences of spills and the effectiveness of the proposed mitigation measures. AEM completed the required assessment and the issue is resolved;
- **CIRNAC-TRC #7**: CIRNAC required an analysis of the potential impacts of the release of treated saline effluent from waterlines to ice-rich soils. AEM conducted and presented the required analysis and the issue is resolved;
- **CIRNAC-TRC #8**: CIRNAC required additional information regarding the design and function of the proposed fiber optic leak detection system that will be used to detect and mitigate potential treated saline effluent spills from waterlines. Based on the additional information AEM provided regarding the design and function of the proposed system that will be used to detect and mitigate potential spills from waterlines, the issue is resolved;
- **CIRNAC-TRC #9**: CIRNAC required detailed information regarding what steps AEM would take to confirm the integrity of the waterlines prior to each operating season, given that the proposed waterlines will remain idle between the start and end of operating periods (winterization). This issue is resolved based on additional information provided by AEM and their commitment to integrating the operation and maintenance component of the waterline system into an existing management plan which will be submitted 60 days prior to the commissioning of the waterline system; and
- **CIRNAC-TRC #10**: CIRNAC required an updated Interim Closure and Reclamation Plan (ICRP) of the proposed amendment in order to reflect AEM's proposed modified scope of the project: covering 80-90% of the proposed waterlines. AEM provided CIRNAC with a summary of how the covering of the twinned waterlines will affect the reclamation and closure strategy for the Meliadine Mine Site. This issue is resolved based on additional information AEM provided.

Based on the evidence considered to date, CIRNAC does not have any outstanding concerns for aspects of the project that fall within its mandate.

Mandate, Roles, and Responsibilities

CIRNAC has a broad mandate for the co-management of land and water resources in Nunavut, as well as the management of Crown land under the following applicable acts and regulations:

- The *Department of Crown-Indigenous Relations and Northern Affairs Act*;
- The *Nunavut Land Claims Agreement Act* and the Nunavut Agreement;
- The *Nunavut Planning and Project Assessment Act* (NuPPAA);

- The *Arctic Waters Pollution Prevention Act* and Regulations;
- The *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and Regulations; and
- The *Territorial Lands Act* and Regulations.

As set out in the Nunavut Agreement (Section 12.8.3) and NuPPAA (Section 112(6)), the Minister of Northern Affairs, in concurrence with other responsible Ministers, will have a decision-making role on the proposed amendment Application's approval to proceed based on the NIRB's Reconsideration Report. If the proposed Project is approved to proceed, CIRNAC will be responsible for the enforcement of the terms and conditions of the NIRB's project certificate, Crown land authorization, and water licences issued for the project.

As part of the NIRB's review process, CIRNAC, along with other parties, acts as an intervenor in the reconsideration process, providing advice and expertise to the NIRB by way of this submission. Based on CIRNAC's regulatory mandate and decision-making roles, CIRNAC is participating in the review process by providing the following expertise related to the Project's proposed works, activities, and associated management, mitigation and monitoring plans:

- environmental impact assessment methodology and best practices, including cumulative effects assessment;
- surface water quality and quantity;
- groundwater quality and quantity;
- marine water quality as affected from land;
- permafrost;
- waste management;
- vegetation;
- crown land contamination/degradation; particularly closure and reclamation planning); and
- socio-economic impact assessment and monitoring.

In addition, CIRNAC administers the Northern Participant Funding Program to help Indigenous Peoples and Northerners access the resources and expertise needed to participate effectively in impact assessments of major resource or infrastructure development projects in the North. To facilitate participation in the NIRB's review process of the Project, CIRNAC has provided funding allocations to nine Indigenous and community organizations who have an interest in the project. The funded organizations include: Kivalliq Inuit Association (KIA), Kivalliq Wildlife Board (KWB), Baker Lake Hunters and Trappers Organization, Aqigiq HTO, Arviat Hunters and Trappers Organization, Issatik Hunters and Trappers Organization, Kangiqłiniq Hunters and Trappers Organization, Northlands Denesuline First Nation and Sayisi Dene First Nation

Specific Comments

Review Comment	**CIRNAC-TRC #1**
Subject / Topic	**Clarification of Underground Mine Groundwater Inflows**
References	FEIS Addendum - Page vi (Need and Purpose of the Project) and Section 3.2.1 (Groundwater Inflow Predictions) Water Management Plan (March 2020, Version 9) FEIS Addendum - Appendix B (Groundwater Management Plan) CIRNAC Information Requests (September 25, 2020)

	AEM Responses to Information Requests (October 13, 2020) AEM Responses to Final Review Comments for Amendment 001 of Project Certificate 006 (August, 2018) AEM Responses to Technical Review Comments (November 20, 2020) Meeting Minutes Between CIRNAC and AEM (December 4, 2020)
Summary	AEM indicates that the Project is required because groundwater inflows to the underground mine at the Tiriganiaq deposit are higher than originally anticipated. The FEIS Addendum presents information and interpretation that is inconsistent with this conclusion. Additional data was therefore required to support the conclusion that groundwater inflow rates have been or are anticipated to be sufficiently greater than originally predicted to justify the Project.
Importance of Issue to Impact Assessment	Based on the information presented by AEM, there was insufficient clarity regarding the volume of saline groundwater to be managed under the Project, as compared to the current Meliadine Gold Mine. In the absence of this information, CIRNAC was unable to confirm whether potential impacts described in the FEIS Addendum are attributable to the current Meliadine Gold Mine (i.e., greater than anticipated saline groundwater flows from mining) or the Project (i.e., conveyance and discharge of treated saline groundwater effluent).
Detailed Review Comment	AEM is seeking approvals to increase the volume of effluent discharged to Melvin Bay from 800 m^3/day to 12,000 m^3/day plus up to an additional 8,000 m^3/day as part of its adaptive water management plan. The FEIS Addendum indicates that the Project is necessary to manage saline groundwater inflows to the underground mine that are greater than originally anticipated. For example, page vi of the FEIS Addendum states: "*Agnico Eagle continues to have challenges to reach the requirements to discharge the water necessary to free-up the capacity for the next freshet due to the large volumes of water from the underground workings that continue to require on-site storage*". Similarly, in response to CIRNAC-IR#4, AEM indicated that: "*What has changed is that due to higher than originally anticipated groundwater flows to the underground, more water must be managed on site, requiring increased discharge to Melvin Bay.*" CIRNAC notes these statements are inconsistent with other parts of the FEIS Addendum which state that current predictions of groundwater flows to the mine are similar to the groundwater inflow predictions for the current Meliadine Gold Mine. Specifically, Section 3.2.1 (Groundwater Inflow Predictions) of the FEIS Addendum states: "*The predicted groundwater inflow rates from this 2019 analysis are similar to the groundwater inflow predictions in the FEIS, which ranged from 420 m^3/day to 640 m^3/day)*." CIRNAC also notes that as part of the approval process for Amendment 001, AEM "*acknowledged that the estimated volumes of groundwater have decreased*".[1] Based on the information provided by AEM (as described above), additional information was required to clarify the volumes of saline groundwater reporting to the mine.

[1] As indicated in AEM's response to CIRNAC Final Comment #1 for Amendment 001 of Project Certificate 006.

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	CIRNAC requested that AEM provide a data summary that compares the current predictions of groundwater inflow rates with those that were originally predicted when the Meliadine Gold Mine was approved. CIRNAC asked that the data summary should span the entire anticipated operational period for the mine (i.e., 2019 to 2027). In response, AEM provided additional information along with a data summary of predicted groundwater inflows from 2020 to 2033. In addition, following CIRNAC's two meetings with them, AEM provided the following additional information: • Explaining that the mine sequencing between the 2014 FEIS and the 2020 FEIS addendum was different - there is more groundwater to manage sooner than expected in the mine life and this is the key driver. • Groundwater management in general has been more challenging than expected. • Updated water balance modelling has reduced the conservatism of the predictions. As a result, despite inflow predictions remaining similar, there is a risk that inflows could go beyond what is currently predicted (i.e., due to less conservatism). Also, AEM committed to updating the Groundwater Management Plan to include the additional information AEM provided to CIRNAC during the meetings.
Recommendation / Request	CIRNAC considers this issue resolved based on the additional information provided by AEM and the following commitment: • AEM commits to updating the Groundwater Management Plan to clarify discrepancies between 2014 FEIS groundwater inflow predictions and the 2020 FEIS Addendum.
Review Comment	**CIRNAC-TRC #2**
Subject / Topic	**Surface Contact Water Discharge via Waterline to Melvin Bay**
References	Water Management Plan (March 2020, Version 9) FEIS Addendum - Section 3.5.1 (Source Water and Discharge Volumes) FEIS Addendum - Appendix A (Meliadine Mine Bay Diffuser Conceptual Design - Effluent Near Field Modelling) FEIS Addendum - Appendix B (Groundwater Management Plan) FEIS Addendum - Appendix F (Ocean Discharge Monitoring Plan, Section 2.1 - Discharge Review) FEIS Addendum - Appendix H (Water Balance) CIRNAC Information Requests (September 25, 2020) AEM Responses to Information Requests (October 13, 2020) AEM Responses to Technical Review Comments (November 20, 2020) Meeting Minutes Between CIRNAC and AEM (December 4, 2020)

	AEM Technical memo on Addendum to 3-D Hydrodynamic Modelling of Melvin Bay to Characterize the Long-Term Mixing and Transport of a Low TDS Effluent (January 6, 2021)
Summary	CIRNAC was seeking clarity regarding the extent to which surface contact water will be conveyed by the proposed waterline for discharge to Melvin Bay.
Importance of Issue to Impact Assessment	The modelling and impact assessment presented in the FEIS Addendum are based on the discharge of treated saline groundwater, without considering the potential implications associated with the discharge of surface contact water. As a result, the FEIS Addendum does not account for the fact that blended water with lower salinity and density could affect dispersion of the plume in the receiving environment (e.g., through buoyancy effects). Any changes to the dispersion of the plume could affect the accuracy of water quality impact predictions.
Detailed Review Comment	There was ambiguity regarding the extent to which the proposed waterlines would be used to convey surface contact water. Based on the FEIS Addendum, it was CIRNAC's prior understanding that the waterline would convey only treated saline groundwater if flow volumes remained below the proposed maximum discharge rate of 12,000 m^3 per day. The FEIS Addendum does, however, include an alternative that, if approved, in the future would increase the system capacity to 20,000 m^3/day, with the incremental 8,000 m^3/day coming from surface contact water. In an effort to understand the implications of AEM's proposal, CIRNAC reviewed the FEIS Addendum to determine the extent to which surface contact water would be conveyed by the proposed waterline. Based on a review of Table 1 of Appendix H to the FEIS Addendum, AEM predicts that between 30% to 50% of the waterline capacity is required to convey treated saline groundwater generated by the mine in any given year of operations. The remaining 50% to 70% would be attributable to the drawdown of AEM's surface water inventory which presumably includes a combination of stored saline groundwater and surface contact water. There was a lack of clarity regarding the potential range of volumes of saline groundwater and surface contact water that may be conveyed by the waterline and how this might affect the environmental performance of the

	conveyance/discharge system. For example, any changes to the dispersion of the plume could affect the accuracy of water quality impact predictions. Additional modelling was therefore required to confirm that all applicable water quality criteria are met at the edge of the mixing zone if waterline discharges have lower salinities than was assumed in current modelling. CIRNAC recommended that AEM would perform a sensitivity analysis of effluent dispersion modelling to confirm that lower salinity effluents will not affect the general conclusions presented in the FEIS Addendum. CIRNAC also asked AEM that the activity of mixing and treating various contact water sources at site, including underground and surface contact water before being discharged into Melvin Bay, be further described in an updated Groundwater Management Plan in accordance with the Term and Condition 25 of the Project Certificate 006, Amendment 001, "*The Proponent shall submit a detailed Groundwater Management Plan to the NIRB which includes mitigation measures designed to address the potential for higher-than-predicted volumes of saline water inflows into the underground mine, treatment and disposal methods, and details of its plan to monitor saline water at site. The plan must identify uncertainties pertaining to predictions for groundwater quality and quantity and inform adaptive management strategies for the site. CIRNAC should be consulted with respect to the contents of the Plan and any required mitigation measures*. " In response to CIRNAC-TRC #2, AEM indicated that it anticipates that half of the total volume discharge to Melvin Bay will be saline groundwater and the second half will be surface contact water. Also, AEM indicated that the range of salinities likely to be discharged to Melvin Bay will be 14,900 to 39,600 mg/L. Following AEM's TRC response , additional discussion occurred regarding the projected proportion of the Waterline discharge that would comprise site surface contact water and a third model scenario of very low TDS (Total Dissolved Solids) (i.e., 2,200 mg/L, not previously included in the modelling report submitted with the CIRNAC–TRC #2). On January 7, 2021, AEM provided a technical memo including the sensitivity analysis of a third model scenario of very low level of TDS (i.e., 2,200 mg/L), which showed that this low TDS level resulted in a maximum salinity change of 0.6%. Even at this low level of TDS, the maximum salinity change at the edge of mixing zone remained below 1%. Also, AEM committed to updating the Groundwater Management Plan to provide further details on mixing and treating of various contact water sources at the mine site.
Recommendation / Request	CIRNAC considers this issue resolved based on the submission of a technical memo by AEM on January 7, 2021, including a sensitivity analysis of a third scenario and the following commitment: • AEM commits to updating the Groundwater Management Plan to provide further details on the Meliadine Gold Mine project activity of mixing and treating various contact water sources at site 30 days after the issuance of the amended Project Certificate 006, Amendment 001.
Review Comment	**CIRNAC-TRC #3**

Subject / Topic	SETP Increased Treatment Capacity and Relevant Contingency Plan
References	FEIS Addendum - Section 3.5 (Current Groundwater Management Practices) FEIS Addendum - Appendix B (Ground Water Management Plan) FEIS Addendum - Appendix F (Ocean Discharge Monitoring Plan) FEIS Addendum - Appendix H (Water Balance) Water Management Plan (March 2020, Version 9) CIRNAC Information Requests (September 25, 2020) AEM Responses to Information Requests (October 13, 2020) AEM Responses to Technical Review Comments (November 20, 2020) Meeting Minutes Between CIRNAC and AEM (December 4, 2020)
Summary	All water conveyed by the proposed waterline and discharged to Melvin Bay will be treated by the SETP. This will require an increase in the SETP treatment capacity and the volume of water processed by the facility. The FEIS Addendum does not include this required activity, nor does it describe contingencies that will be put in place to manage situations where the SETP is unable to treat all water that is discharged to Melvin Bay.
Importance of Issue to Impact Assessment	AEM proposes to increase the volume of water processed by the SETP by up to 1,150%. The expansion of the facility and increased water treatment has the potential to result in incremental environmental impacts that have yet to be assessed. For example, increased water treatment by the SETP will generate greater quantities of water treatment sludge which, under some circumstances, could cause incremental environmental impacts (e.g., seepage of metals from sludge).
Detailed Review Comment	AEM's response to CIRNAC-IR #1 indicated that all water conveyed through the proposed waterline will be treated by the SETP. AEM has stated that the maximum treatment capacity of the SETP is currently rated at 1,600 m^3/day (after upgrade). In its response to NIRB-IR #2, AEM indicated that the SETP will be expanded to achieve a treatment capacity ranging from 12,000 m^3/day to 20,000 m^3/day. This expansion has the potential to create incremental impacts. This could result in an increase of environmental impacts unless appropriate mitigations are put in place. CIRNAC notes that the SETP will be a critical piece of infrastructure in AEM's water management efforts. In this regard, CIRNAC sought clarification regarding what contingencies AEM is putting in place to manage situations where the effective treatment capacity of the SETP is less than required (e.g., sub-standard plant performance and/or increases in the volume of water requiring treatment). In its response to CIRNAC-TRC #3 and in the following meetings with them, AEM provided further clarification but also acknowledged this activity is not part of waterline environmental impact assessment as it is under the jurisdiction of the Nunavut Water Board (NWB). AEM stated that it plans to expand the treatment capacity of the SETP to a total of up to 20,000 m^3/day to be aligned with the proposed alternative discharge scenario of 20,000 m^3/day. If less flow is required

	to be treated, the approach would consist of operating the treatment plant by batch or at lower flow during the discharge season. In response to CIRNAC's request for additional clarification on SETP-generated sludge management, AEM stated that it is investigating multiple options, including management of sludge in CP1, waste rock storage piles, the tailings storage facility and mined out pits. AEM will submit an updated SETP Design Report (20,000 m^3/day) to NWB which will be available for review and comment as part of Water Licence requirements after the NIRB's approval of the waterline project proposal. Also, AEM made a commitment to updating the Water Management Plan to include the multiple options for the management of the increased volume of sludge.
Recommendation / Request	CIRNAC considers this issue resolved based on the additional clarification AEM provided and the following commitment: • AEM commits to updating the Water Management Plan to include the multiple options for the management of the increased volume of sludge.
Review Comment	**CIRNAC-TRC #4**
Subject / Topic	**Process Modifications to Avoid Non-Compliance Issues**
References	FEIS Addendum - Section 6.1.3 (Water Quality) FEIS Addendum - Appendix B (Ground Water Management Plan, Section 3.4.2.1) FEIS Addendum - Appendix H (Water Balance, Section 2.1) Water Management Plan (March 2020, Version 9, Sections 3.9.4 and Section 3.9.5) CIRNAC Information Requests (September 25, 2020) AEM Responses to Information Requests (October 13, 2020) AEM Responses to Technical Review Comments (November 20, 2020) Meeting Minutes Between CIRNAC and AEM (December 4, 2020) Waterline FEIS Amendment Meliadine Mine CIRNAC Technical Comment Follow-up Request (January 7, 2020)
Summary	CIRNAC was seeking clarity regarding how AEM will confirm that all treated effluent is compliant for release prior to being discharged to Melvin Bay via the waterline system.
Importance of Issue to Impact Assessment	The discharge of effluent that does not conform with applicable regulatory criteria has the potential to result in adverse environmental impacts. The discharge of non-compliant water to Melvin Bay could cause acute or chronic effects to biota within the receiving environment of Melvin Bay. Additional measures are necessary to verify that treated effluent meets applicable criteria prior to discharge to Melvin Bay.
Detailed Review	AEM described measures that will be taken to mitigate non-compliance effluent discharge events. It was unclear to CIRNAC how those measures would identify

Comment	and prevent the release of non-compliant effluent prior to its release. Specifically, according to AEM's response to CIRNAC-IR #1 (Figure CIRNAC-IR-1a), treated effluent from the SETP will be released on a batch basis to a holding pond (SP3) from which it will subsequently be conveyed by the waterline to Melvin Bay on a continual (or batch) basis during the open water season. Based on its response to the NIRB-IR #28, AEM is evaluating whether there is a need to have an intermediate pond (such as SP3) between the treatment plant and the waterline. AEM has concluded that: "*The most favorable option would be not using the intermediate pond and feed directly the pumping station with treated water*". CIRNAC was seeking additional evidence to verify that discharges of treated effluent, whether indirect (through temporary holding saline ponds – SP3) or direct (from the SETP), into the proposed waterline will be compliant. CIRNAC requested that AEM describe the actions that would be taken to test and store treated effluent until confirmation that the treated water is compliant with regulatory criteria prior to its discharge to Melvin Bay, whether by indirect or direct means to the waterline. Also, CIRNAC sought clarity regarding the turnaround time on analytical results, as well as the frequency of testing. Specifically, CIRNAC wanted to understand the volume of non-compliant water that could potentially be discharged to the ocean from the time a sample is collected and a result is reported by the laboratory and a response is initiated/actioned. In its response to CIRNAC-TRC #4, AEM indicated that during the SETP treatment process, water quality from the treatment plant will be monitored on a regular basis for pH, conductivity, chloride, ammonia and turbidity and the results will be compared to the regulatory discharge limits (e. g., MDMER criteria or operational targets) for discharge to Melvin Bay. Once water quality results meet the discharge criteria, treated water will then be diverted to the waterline. If during operations, water quality concentrations exceed the discharge criteria, the discharge to Melvin Bay will be stopped and water will be recirculated to the saline storage ponds. At this point, the treatment plant will go through the optimization process again. Also, following two meetings with them, AEM provided detailed information on January 7, 2021, on management steps, monitoring overview and the potential volume of non-compliant discharge water resulting from potential process upsets.
Recommendation / Request	CIRNAC is satisfied with the provided response and considers the issue resolved.
Review Comment	**CIRNAC-TRC #5**
Subject / Topic	**Water Quality and Load Balance Conceptual Model**
References	Water Management Plan (March 2020, Version 9) FEIS Addendum - Appendix B (Groundwater Management Plan) FEIS Addendum - Appendix D (Roads Management Plan)

	FEIS Addendum - Appendix H (Water Balance) CIRNAC Information Requests (September 25, 2020) AEM Responses to Information Requests (October 13, 2020) AEM Responses to Technical Review Comments (November 20, 2020) Meeting Minutes Between CIRNAC and AEM (December 4, 2020)
Summary	The FEIS Addendum does not indicate what changes would occur at the Meliadine Gold Mine site in terms of its water management strategy if the Project is approved. Additional information was necessary to address this gap.
Importance of Issue to Impact Assessment	The proposed undertaking involves a significant change to the water management strategy that is regulated under Project Certificate 006, Amendment 001 for the Meliadine Gold Mine. The FEIS Addendum focuses on the waterline without describing the associated changes to water management practices at the Meliadine Gold Mine Site from the Project. In the absence of this information, CIRNAC was unable to confirm the accuracy of AEM's impact predictions.
Detailed Review Comment	As indicated in CIRNAC-IR #4, the proposed amendment involves changing multiple aspects of the water management strategy for the mine site. For example, in addition to the discharge of up to 12,000 m^3/day of effluent, it is CIRNAC's understanding that the following changes may occur if the proposed amendment is approved: 1) reduced reliance on the Saline Water Treatment Plant (SWTP); 2) increased saline groundwater and surface contact water processing by the SETP; 3) potential changes to Meliadine Lake discharges; 4) elimination of saline effluent trucking; and 5) modifications to the operation of water management structures at the Meliadine Mine Site. Based on CIRNAC's technical review of the FEIS Addendum and supporting documentation (including Appendix H – Water Balance) as part of the Information Request stage, it was noted that AEM's submission did not include an updated Water Quality and Load Balance Conceptual Model. As a result, CIRNAC-IR #4 requested that AEM provide a conceptual Water Quality and Load Balance Model associated with the proposed project and that the model clearly indicate all proposed changes relative to the currently approved project. While the simplified conceptual flow diagrams of the current and proposed water management strategy (including water conveyance and discharge) that AEM provided to CIRNAC helped to clarify some aspects of the proposed amendment, it does not illustrate what on-site changes would occur to overall water management strategy/practices in the event the proposed amendment is approved. CIRNAC requested that AEM provide a revised conceptual Water Quality and Load Balance Model for all aspects of the proposed project, assuming the proposed amendment is authorized to proceed. In responses to CIRNAC-TRC #5, AEM provided three Water Balance Summary tables which helped CIRNAC understand the changes to the site water balance if

	the Waterline was approved. Regarding additional clarifying questions by CIRNAC around on-site storage capacity, AEM indicated that without approval of the waterline, AEM would run out of storage capacity in 2024 and would have limited options: either emergency storage or cessation of mining.
Recommendation / Request	CIRNAC is satisfied with the provided response and considers the issue resolved.
Review Comment	**CIRNAC-TRC #6**
Subject / Topic	**Waterline Failure Modes and Potential Effects Assessment**
References	FEIS Addendum - Section 3.4.6 (Spill Management) FEIS Addendum - Section 7 (Environmental Assessment Methodology) FEIS Addendum - Section 8 (Effects Assessment) FEIS Addendum - Appendix C (Spill Contingency Plan) FEIS Addendum - Appendix D (Roads Management Plan – Section 9) FEIS Addendum - Appendix G (Effects Assessment Methodology Supplementary Information) FEIS Addendum – Appendix C (Spill Contingency Plan (Appendix H (General Response Procedures for Spilled Saline Water)) CIRNAC Information Requests (September 25, 2020) AEM Responses to Information Requests (October 13, 2020) AEM Responses to Technical Review Comments (November 20, 2020) Meliadine Waterline – Failure Modes and Effects Analysis (November 20, 2020) Meeting Minutes Between CIRNAC and AEM (December 4, 2020)
Summary	AEM had not completed a detailed assessment of waterline failure modes and potential effects. There was insufficient information to identify and characterize potential spills and their environmental impacts. There was uncertainty regarding the potential environmental consequences of spills and the extent to which they can be effectively mitigated by the proposed mitigation measures.
Importance of Issue to Impact Assessment	The unplanned release of saline water from the waterline may result in impacts to the terrestrial, aquatic, or marine environments. In order to operate the proposed waterlines without causing such impacts, the project designs should explicitly identify, characterize, avoid and mitigate all potentially significant waterline failure modes. This will help to ensure that all relevant failure modes are factored into the final designs and management plans for the waterlines.
Detailed Review Comment	CIRNAC-IR#9 requested that AEM identify potential failure modes and effects associated with the waterline system. As part of the response, AEM provided a qualitative summary of potential accidents and malfunctions along with likelihood, consequences, and measures that would be implemented. In addition, AEM indicated that they are yet to complete a detailed quantitative analysis of waterline failure modes and effects.

	CIRNAC maintained that a quantitative assessment of failure modes should be performed prior to the finalization of detailed designs for the Project. This will help to ensure the designs are capable of avoiding and/or mitigating the impacts associated with the accidental spills from the waterline. CIRNAC-TRC #6 requested that AEM identify and quantify relevant scenarios involving accidental releases of saline effluent to the terrestrial, freshwater and marine environments. The scenarios should quantify the maximum volume of effluent that could credibly be released to the environment. The evaluation should be provided prior to the finalization of detailed designs for the waterline. In response to CIRNAC-TRC #6, AEM provided CIRNAC with a detailed Failure Modes and Effects Analysis (FMEA) report.
Recommendation / Request	CIRNAC is satisfied with the provided response and considers the issue resolved.
Review Comment	**CIRNAC-TRC #7**
Subject / Topic	**Potential Impacts of Saline Water to Ice-Rich Soils**
References	FEIS Addendum - Section 4 (Project Changes Interactions and Management) FEIS Addendum - Section 8 (Effects Assessment) FEIS Addendum - Appendix C (Spills Contingency Plan) FEIS Addendum - Appendix D (Roads Management Plan, Sections 4.3 and 5) FEIS Addendum - Appendix E (Erosion and Sediment Control Plan for the Treated Groundwater Effluent Discharge Project) FEIS Addendum – Appendix C (Spill Contingency Plan (Appendix H (General Response Procedures for Spilled Saline Water)) CIRNAC Information Requests (September 25, 2020) AEM Responses to Information Requests (October 13, 2020) AEM Responses to Technical Review Comments (November 20, 2020) Meeting Minutes Between CIRNAC and AEM (December 4, 2020) Technical Memorandum: Rationale for Classifications of Saline Water Spill to Ice-rice Soils in FMEA Waterline Addendum (January 8, 2021)
Summary	The FEIS Addendum did not consider potential impacts to ice-rich soils if saline water is released to the tundra in the vicinity of the waterline.
Importance of Issue to Impact Assessment	Ice-rich tundra soils can potentially be negatively impacted when exposed to saline water released from the waterline.
Detailed Review Comment	The proposed waterlines will be constructed on or in the vicinity of ice-rich soils. Such soils experience adverse impacts when exposed to fluids with elevated salinity. Impacts can include rapid and extensive degradation of the structural integrity of soils which can, in turn, result in slumping, soil erosion, impacts to surface waters (as Total Suspended Solids (TSS) or sedimentation) and

	structural damage to infrastructure. Even small spills of saline liquids (e.g., drilling fluids) have resulted in rapid and significant impacts on local ice-rich soils. The FEIS Addendum did not analyze/assess the potential environmental impacts that could occur if such soils are exposed to saline water that is released from the waterline (e.g., in the event of a planned release or spill). Further information was required to evaluate the potential impacts associated with the scenarios. CIRNAC requested that AEM assess the impacts associated with the release of saline water to the terrestrial environment at locations where ice-rich soils are present. The impacts should be based on a reasonable worst case release scenario (e.g., x minutes of uncontrolled release from the waterline) as identified in the Failure Modes Assessment recommended under CIRNAC-TRC #6. In its responses to CIRNAC-TRC #7, AEM provided some information on potential impacts of an accidental spill to the terrestrial environment (per CIRNAC TRC #6) and its planned mitigation measures. Following two meetings, AEM provided CIRNAC with additional information including a technical memorandum on January 8, 2021, on the rationale for a low environmental impact classification for a worst-case environmental impact scenario.
Recommendation / Request	CIRNAC is satisfied with the response AEM provided and considers the issue resolved.
Review Comment	**CIRNAC-TRC #8**
Subject / Topic	**Monitoring and Prevention of Waterline Spills Using Fiber Optic Leak Detection System**
References	FEIS Addendum - Section 5.1 and Table 14 FEIS Addendum - Appendix C (Spill Contingency Plan) FEIS Addendum – Appendix C (Spill Contingency Plan (Appendix H (General Response Procedures for Spilled Saline Water)) Waterline Consultations Report (August 28, 2020) CIRNAC Information Requests (September 25, 2020) AEM Responses to Information Requests (October 13, 2020) AEM Responses to Technical Review Comments (November 20, 2020) Meeting Minutes Between CIRNAC and AEM (December 4, 2020) AEM Memo on Fiber Optic Leak Detection (January 15, 2021)
Summary	The FEIS Addendum indicates that spills from the saline waterline will be prevented through the use of a fiber optic leak detection system. There was insufficient information available regarding the design and function of this system to confirm it will be effective in efforts to proactively detect and mitigate potential spills.
Importance of Issue to Impact Assessment	AEM indicated that spills will have a minimal environmental impact because they will be identified and mitigated rapidly by the leak detection system. Given the importance of the system in mitigating impacts that might otherwise occur,

	additional evidence was required to verify that it will function as intended.
Detailed Review Comment	The FEIS Addendum indicated that a *"fiber optic leak detection system"* will be installed to monitor the waterlines for potential leaks. No information was provided indicating how this system would work, or how effective it will likely be in mitigating potential leaks from the waterlines. CIRNAC-IR #11 requested that AEM provide details regarding the design and function of the fiber optic leak detection system and how emergency response would be actioned. In addition, CIRNAC requested that AEM provide examples of a similar system operating in northern climates. AEM's response was limited to the following: "*The leak detection system uses multimode leak detector to identify the physical characteristics of a leak, such as changes in temperature, pressure, ground strain and acoustics. The fiber-optic cable acts as a fully distributed sensor that offers thousands of detection points along the entire pipeline, capable of pinpointing the location of a leak within 10 m, in real time. Similar systems are in use in many northern regions, such as Russia and Alberta."* Based on this response, in CIRNAC-TRC #8 CIRNAC requested additional details regarding the design and function of the fiber optic leak detection system and how an emergency response would be actioned. In addition, CIRNAC requested that AEM provide specific examples of projects where similar systems have been used effectively in northern climates. In its responses, AEM indicated that the fiber optic leak detection system will play a critical role in preventing and mitigating potential waterline releases. CIRNAC further requested that AEM provide follow-up information on this system with a specific example where it is in operation. Following the two meetings, AEM submitted the requested follow-up information in a memo on January 15, 2021.
Recommendation / Request	CIRNAC is satisfied with the additional information AEM provided and considers the issue resolved.
Review Comment	**CIRNAC-TRC #9**
Subject / Topic	**Annual Waterline Shutdown and Restart Plan**
References	FEIS Addendum CIRNAC Information Requests (September 25, 2020) AEM Responses to Information Requests (October 13, 2020) AEM Responses to Technical Review Comments (November 20, 2020) Meeting Minutes Between CIRNAC and AEM (December 4, 2020)
Summary	The proposed waterlines will be winterized at the end of each operating season and re-commissioned prior to the subsequent season. Additional details are required to confirm the steps AEM will take each year to confirm the integrity of the waterline.
Importance of Issue to Impact	The waterlines will remain empty and idle for approximately nine months between operating seasons. There is a potential that the waterlines will be

Assessment	damaged or otherwise compromised during this period and that this will result in subsequent unplanned release of treated effluent to the environment when operations resume during the subsequent season.
Detailed Review Comment	The majority of technical descriptions presented in the revised FEIS Addendum relate to the marine environment portion of the proposed amendment (i.e., the saline effluent outfall and diffuser in Melvin Bay). In contrast, the revised FEIS Addendum presents very limited information regarding the design and operation of the ~34 km terrestrial portion of the conveyance system. To address this information gap CIRNAC-IR #12 requested that AEM provide further details on the terrestrial portion of the system. AEM's response generally provided sufficient information regarding the construction and operation of the proposed waterline. Following a review of that information, CIRNAC requested additional details on the activities that will be undertaken by AEM prior to each subsequent open water season before the start of waterline use to ensure waterline integrity before treated saline water is pumped into the waterlines. In its responses to CIRNAC-TRC #9, AEM provided CIRNAC with a high-level summary of steps that will be taken prior to the beginning of each open water season. This included a thorough visual inspection of the whole waterline every year, before the saline water pumping operation begins, to identify and correct any deficiencies. Also, AEM committed during subsequent meetings to integrating the operation and maintenance component of the Waterline system into an existing management plan.
Recommendation / Request	CIRNAC considers this issue resolved based on the following commitment: • AEM commits to integrating the operation and maintenance component of the Waterline system into an existing management plan. This plan will be submitted 60 days prior to the commissioning of the Waterline.
Review Comment	**CIRNAC-TRC #10**
Subject / Topic	**Closure and Reclamation Plan Related to Burial of the Waterline**
References	FEIS Addendum FEIS Addendum - Appendix I (Waterline Security Estimate, as of June 25, 2020) Interim Closure and Reclamation Plan (July 30, 2020) CIRNAC Information Requests (September 25, 2020) AEM Responses to Information Requests (October 13, 2020) Waterline Consultations Report (August 28, 2020) AEM Responses to Technical Review Comments (November 20, 2020) Meeting Minutes Between CIRNAC and AEM (December 4, 2020)
Summary	Subsequent to the issuance of the FEIS Addendum, AEM committed to burying 80-90% of the waterline. This change is not yet reflected in the Interim Closure and Reclamation Plan (ICRP) for the project, nor the waterline security estimate.

Canada

Importance of Issue to Impact Assessment	The reclamation strategy for the waterline has the potential to result in environmental impacts that may need to be mitigated.
Detailed Review Comment	On August 28, 2020, AEM issued a revised Waterline Consultations Report which stated: "*Agnico Eagle will bury/cover between 80-90% of the waterline and will continue to work with the HTO, KIA, Elders, and the community on site specific locations. This will replace commitment 1 to build crossings if this is the preferred mitigation method*." CIRNAC-IR #13 requested a number of clarifications regarding the burial of the waterlines. AEM's responses to CIRNAC's requests were adequate. However, no descriptions were provided regarding how the buried waterlines will be managed during the closure and reclamation process for the Meliadine Mine Site. CIRNAC-TRC #10 requested that AEM describe how the burial of the waterlines will affect the reclamation and closure strategy (plans and liabilities) for the mine site. In responses, AEM provided CIRNAC with a summary of how the burial of the twinned waterlines will affect the reclamation and closure strategy for the mine site. AEM committed to incorporating the details about the potential effects of the burial of waterlines, on reclamation and closure strategy, into the next iteration of the Interim Closure and Reclamation Plan.
Recommendation / Request	CIRNAC is satisfied with the response AEM provided and considers the issue resolved.

Conclusion

CIRNAC's review process consisted of the assessment of biophysical and socio-economic aspects of the proposed amendment under its mandate and areas of jurisdiction. This included participation in information sessions, IRs and TRCs submissions. Both IRs and TRCs submissions received responses from AEM. In addition to these written submissions, there were several formal NIRB meetings which included: a Technical Meeting, a Community Roundtable and a Pre-hearing Conference.

CIRNAC's review of the Project resulted in 10 TRCs and recommendations for consideration by the NIRB and AEM. Following AEM's responses to TRCs, CIRNAC had two meetings with AEM with the view to resolve the outstanding issues.

All technical comments with their current status are described in detail in the CIRNAC TRCs presented in section 2.

Fisheries and Oceans Canada

Executive Summary

On behalf of DFO, the Fisheries Protection Program (FFHPP) has reviewed the updated FEIS Addendum and associated management plans related to the Project, as they relate to the departmental mandate under the *Fisheries Act (FA)*, to conserve and protect fisheries and aquatic ecosystems for future generations. DFO's primary focus of this review was to ensure that works, undertakings and activities are conducted in compliance with the applicable provisions of the *FA.*

DFO submitted TRCs on the Project addressing information gaps and clarification on the methodology of installation for the proposed waterlines along the all-weather access road (AWAR) and discharge waterline into Melvin Bay. The two TRCs submitted by DFO were:

- **DFO-TRC #1:** DFO indicated the preference of installation of fish-friendly waterline crossing such as: clear-span crossings and Horizontal Directional Drilling (HDD); If streams are found to support fish please engage with DFO to ensure that all fish frequented watercourses adequately enable fish passage.
- **DFO-TRC #2:** DFO requested that the proponent provide a Request for Review (RFR) for the proposed waterline installation into Melvin Bay.

DFO considers both TRCs resolved as AEM has provided additional information and clarification on installation methods and have submitted a RFR, that is currently under review.

Mandate, Roles, and Responsibilities

DFO's mandate is to lead the Government of Canada's work to protect and promote Canada's three oceans and waterways, sustain and rebuild the fisheries, and ensure that they remain healthy for future generations, while providing important economic opportunities to Canadians and coastal communities. On behalf of DFO, the Fish and Fish Habitat Protection Program (FFHPP) is responsible for leading the review of project proposals that are in and/or around fisheries waters, and for ensuring that such proposed works, activities and undertakings are conducted in such a way that the proponents are in compliance with the applicable provisions of the *FA.* Sub-section 35 (1) of the *FA* states that "No person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat."

However, under Paragraph 35 (2) (b) of the *FA*, the Minister of Fisheries, Oceans and the Canadian Coast Guard may issue an authorization with terms and conditions in relation to a proposed work, undertaking or activity that may result in death of fish and/or harmful alteration, disruption or destruction of fish habitat. The above are subject to the consideration of the factors in Section 34.1 (1) of the *FA*:

1. the contribution to the productivity of relevant fisheries by the fish or fish habitat that is likely to be affected;
2. fisheries management objectives;
3. whether there are measures and standards
    a) to avoid the death of fish or to mitigate the extent of their death or offset their death, or,
    b) to avoid, mitigate or offset the harmful alteration, disruption or destruction of fish habitat;
4. the cumulative effects of the carrying on of the work, undertaking or activity referred to in a recommendation or an exercise of power, in combination with other works, or activities that have been or are being carried on, on fish and fish habitat;
5. any fish habitat banks, as defined in section 42.01, that may be affected;
6. whether any measures and standards to offset the harmful alteration, disruption or destruction of fish habitat give priority to the restoration of degraded fish habitat;
7. Indigenous knowledge of the Indigenous peoples of Canada that has been provided to the Minister; and any other factor that the Minister considers relevant.

Expert advice provided by DFO to the NIRB, as reflected in comments below, are made respecting DFO's mandate stated above.

Canada

Specific Comments

Review Comment	**DFO-TRC #1**
Subject / Topic	**Waterline Installation**
References	Waterline FEIS Addendum-IR response, Page 30 (October 13, 2020) DFO's response to the NIRB: Meliadine Gold Mine- 2020 Saline Discharge Strategy and Saline Effluent Discharge to Marine Environment Amendment (April 2020) Appendix IR-6 Waterline layout and covered sections (February 4, 2021)
Summary	AEM has indicated that crossings that are currently supported by bridges along the AWAR will have the waterline run directly under and be secured to the existing bridge, avoiding disturbance to fish and fish habitat below the high water mark. For crossings where streams are currently not supported by bridges, AEM proposed to bridge the waterline using concrete blocks as anchor points on the bank. AEM has indicted that heavy machinery will not be used within the high watermark during installation and that they will ensure that proper sediment control measures will be in effect.
Importance of Issue to Impact Assessment	It is important for DFO to have a complete understanding of the proposed activities and the associated watercourses in order to accurately account for the amount, location and type of alternation (s) to fish habitat.
Detailed Review Comment	AEM addressed DFO-TRC #1 concerning clarification on the methodology of installation through email and phone correspondence. DFO is satisfied with information that has been provided by AEM and considers this issue resolved.
Recommendation / Request	DFO considers this issue resolved. DFO encourages AEM to continue to engage with DFO to avoid disturbance to fish and fish habitat.
Review Comment	**DFO-TRC #2**
Subject / Topic	**Construction/Installation of Discharge Waterline and Diffuser**
References	Waterline FEIS Addendum-IR response, Page 30 (October 13, 2020) DFO's response to NIRB: Meliadine Gold Mine- 2020 Saline Discharge Strategy and Saline Effluent Discharge to Marine Environment Amendment (April 2020) Microsoft Teams Meeting- 11-HCAA-CAS7-00014 update- waterline to Melvin between AEM and DFO (October 28, 2020) Request for Review 'Treated Groundwater Effluent Discharge Project for the Meliadine Gold Mine' (November 20, 2020)
Summary	AEM confirmed that HDD will be used to install the new waterline. The proposed work will occur below the High Water Mark with a footprint of approximately 500-750m^2 . DFO requested that AEM submit a Request for Review (RFR) for the proposed work.

	On November 20, 2020 AEM submitted their RFR to DFO and indicated that they will continue to engage with DFO throughout the regulatory review phase.
Importance of Issue to Impact Assessment	It is important for DFO to have a complete understanding of the proposed activities and the associated watercourses in order to accurately account for the amount, location and type of alternation (s) to fish habitat.
Detailed Review Comment	AEM addressed DFO-TRC #2 by providing their RFR for the proposed waterline installation into Melvin Bay. DFO is currently reviewing the RFR and views HDD as low-impact to fish and fish habitat. DFO encourages AEM to continue to engage with DFO to avoid disturbance to fish and fish habitat.
Recommendation / Request	DFO considers this issue resolved. DFO is currently in the propose of reviewing the RFR and will continue to work with AEM throughout the regulatory review process to adequately manage any potential impacts to fish and fish habitat.

Conclusion

DFO considers both DFO-TRC #1 and DFO-TRC #2 resolved as AEM has provided the additional information requested and the RFR. The RFR will be reviewed through DFO's regulatory review process, which is sufficient to resolve and manage any potential impacts to fish and fish habitat.

DFO recommends that AEM continue to work with DFO-FFHPP to avoid disturbance to fish and fish habitat within all watercourses that are classified as fish-frequented.

Environment and Climate Change Canada

Executive Summary

ECCC is submitting its FWS for the Project to fulfill legislated requirements to provide specialist expert information or knowledge within ECCC's possession to the NIRB and licensing authorities for consideration under Article 12 of the Nunavut Agreement and Section 197 of the *Nunavut Planning and Project Assessment Act (NuPPAA)*.

ECCC's expert advice is provided in the context of the *Canadian Environmental Protection Act (CEPA)* including the Disposal at Sea (DAS) Regulations, the pollution provisions of the *FA* including the Metal and Diamond Mining Effluent Regulations (MDMER), the *Migratory Birds Convention Act (MBCA)*, and *the Species at Risk Act (SARA)*.

ECCC's FWS summarizes TRCs identified by ECCC during the review of the Project and the FEIS Addendum.

All of ECCC's TRCs have been resolved as summarized below:

- **ECCC-TRC #1:** ECCC requested AEM to include invertebrate sampling as a monitoring objective of the Ocean Discharge Monitoring Plan (ODMP). On November 20, 2020, AEM provided additional information regarding the circumstances under which a benthic invertebrate study would be conducted. AEM met with ECCC to discuss the issue on December 8, 2020. The issue is now resolved.

- **ECCC-TRC #2:** ECCC requested AEM to specify the volumes of freshwater that will be discharged to the marine environment in order to assess impacts of the diversion of site runoff to Melvin Bay on the flow and water level regimes of Meliadine Lake. AEM provided this information on November 20, 2020. The issue is now resolved.

Mandate, Roles, and Responsibilities

ECCC carries out its legislated responsibility under Article 12 of the Nunavut Agreement and Section 197 of *NuPPAA* by providing recommendations, advice, and information within its mandate to both the proponent and decision-makers. ECCC's advice may be used to develop potential conditions or measures that may accompany a final decision for the Project.

The mandate of ECCC is determined by the statutes and regulations under the responsibility of the Minister of Environment and Climate Change. In delivering this mandate, ECCC is responsible for the development and implementation of policies, guidelines, codes of practice, inter-jurisdictional and international agreements, and related programs. ECCC's specialist advice is provided in the context of the *CEPA* including the DAS Regulations, the pollution provisions of the *FA* including the MDMER, the *MBCA*, and the *SARA.*

ECCC administers the pollution prevention provisions of the *FA*, which prohibits the deposit of a deleterious substance into water frequented by fish. The MDMER regulate the deposit of mine effluent and mine waste into water frequented by fish and places referred to in subsection 36(3) of the *FA*. Under MDMER, Environmental Effects Monitoring is a science-based performance measurement tool used to evaluate the adequacy of the effluent regulation in protecting fish, fish habitats and the usability of fisheries resources. ECCC also regulates DAS under *CEPA* with the objective of protecting the marine environment. Regulated aspects of DAS include the loading of material for disposal, the transport of that material to a disposal site and the disposal itself.

ECCC is responsible for protecting and conserving migratory bird populations and individuals under the *MBCA*. ECCC also administers *SARA* in cooperation with DFO and the Parks Canada Agency (PCA) to prevent wildlife species from being extirpated or extinct; to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity; and to manage species of special concern to prevent them from becoming threatened, endangered or extirpated.

Specific Comments

Review Comment	**ECCC-TRC #1**
Subject / Topic	**Monitoring in the Marine Environment**
References	FEIS Addendum - Appendix F (Ocean Discharge Monitoring Plan, Document # 331124) KWB-IR-17 - Kivalliq Wildlife Board Information Request (directed to ECCC, Document # 331601) FEIS Addendum - Tables 13 and 14 (Document # 331124) AEM Responses to Technical Comments (Nov. 20, 2020, Document # 331987) ECCC/AEM Meeting Minutes Meliadine Waterline Project (Meeting Minutes Package Re: Technical Comment Status, AEM, Document # 332178)

Summary	AEM proposes in the ODMP to monitor and validate potential Project impacts in the marine environment. The ODMP relies solely on water quality sampling. ECCC recommended that invertebrate sampling be added as a monitoring objective of the ODMP to minimize uncertainty of impacts to marine birds related to habitat changes and address concern about impacts to marine birds (i.e. eiders) raised by Kivalliq Wildlife Board (KWB) during the review.
Importance of Issue to Impact Assessment	Invertebrate sampling is a cost-effective monitoring measure that will minimize uncertainty of impacts to marine birds related to habitat changes and address concern about impacts to marine birds (i.e. eiders) raised by KWB.
Detailed Review Comment	AEM responded to ECCC-TRC #1 concerning monitoring in the marine environment on November 20, 2020, prior to the Technical Meetings. AEM indicated that the ODMP currently focuses on water quality only and does not include invertebrate monitoring because no adverse effects are predicted from the marine discharge. Results of hydrodynamic modelling conducted for the Project suggest that saline effluent concentrations will be less than 1% above marine water by the edge of mixing zone,100 m from the discharge point, under the scenarios of high salinity effluent and low salinity effluent. AEM will undertake a plume delineation study, as required by the MDMER, to confirm the percent of saline effluent concentrations at the edge of the 100 m mixing zone during the first open-water season once discharge from the waterline and the new diffuser is initiated. If saline effluent is measured at more than 1% above marine water at the edge of the 100 m mixing zone, a benthic invertebrate study will be conducted. The benthic invertebrate study will follow Environmental Effects Monitoring guidance for benthic invertebrate monitoring as required by MDMER. AEM also met with ECCC on December 8, 2020 to discuss this issue. AEM informed ECCC of their technical discussion with KWB on December 17, 2020, and that the KWB supported the proposed community-based monitoring of shellfish/mussels to address their concerns (KWB TRC-04). ECCC has reviewed the material provided by AEM and following the additional discussions with AEM has determined that it satisfies the requirements of monitoring in the marine environment.
Recommendation / Request	ECCC considers this issue resolved. ECCC has no further recommendations.
Review Comment	**ECCC-TRC #2**
Subject / Topic	**Drainage Reductions**
References	AEM Responses to Information Requests - Appendix 2 (Technical Memorandum: Impact Assessment of the Diversion of Site Runoff to Melvin Bay on the Flow and Water Level Regimes of Meliadine Lake. Golder, Oct. 8, 2020, Document # 331707) AEM Responses to Technical Comments (Nov. 20, 2020, Document # 331987)
Summary	The Technical Memorandum quantifies the reduction in land area drainage with the assumption that the area of diverted site runoff includes the entire A

	and B sub-watershed areas. The report concludes that the diversion will result in a small reduction in overall flows and negligible effects on the levels of Meliadine Lake. ECCC requested that AEM specify the volumes of freshwater that will be discharged to the marine environment (i.e. removed from the Meliadine watershed) including diverted freshwater and contact water from other sources (e.g. make-up water and potable water withdrawals from Meliadine Lake). If the total results removed from the watershed are greater than the volumes identified in the Technical Memorandum, the effects should be re-assessed.
Importance of Issue to Impact Assessment	Effects to Meliadine Lake from diverting freshwater volumes from the watershed for discharge to the marine environment.
Detailed Review Comment	AEM responded to ECCC-TRC #2 concerning drainage reductions assessed in the Technical Memorandum by Golder on November 20, 2020, prior to the Technical Meetings. AEM indicated that the actual expected diversion quantities became available following the assessment by Golder on October 8, 2020. The total diverted quantity is expected to be approximately 1,941,000 m^3/yr, corresponding to approximately 2% of the annual water yield of Meliadine Lake. This amount is less than the total diverted quantity assumed by Golder, which was approximately 6,410,000 m3/yr, corresponding to approximately 7% of the annual water yield of Meliadine Lake. This confirms that the assessment by Golder is conservative. ECCC has reviewed the material provided by AEM and has determined that it satisfies the requirements of assessing the effects of drainage reductions on Meliadine Lake.
Recommendation / Request	ECCC considers this issue resolved. ECCC has no further recommendations.

Conclusion

ECCC's technical comments on invertebrate monitoring in the marine environment and on freshwater water drainage reductions from Meliadine Lake have been resolved. ECCC has no further comments.

ECCC acknowledges and appreciates the effort that AEM has taken to provide information on the FEIS Addendum to inform parties for the reconsideration process. ECCC would like to thank the NIRB for this opportunity to provide input to the reconsideration process.

ECCC's technical review comments and recommendations are not to be interpreted as any type of acknowledgement, compliance, permission, approval, authorization, or release of liability related to any requirements to comply with federal or territorial statutes and regulations.

Health Canada

Executive Summary

HC helps Canadians maintain and improve their health. In the environmental impact assessment of proposed major projects, HC provides expertise on human health impact and recommendations to reduce risks. For the Project, HC has reviewed human health-relevant technical materials. HC does not have a regulatory or decision-making role with respect to the Project.

Below is a summary of HC's comments and recommendations regarding the human health risk assessment (HHRA) for the NIRB's consideration:

- **HC-TRC #1.1 Key issue: The potential health risks due to uncertainty with harvesting in the area near the saline effluent discharge:** There has been inconsistent information on country food harvesting in Melvin Bay, Itivia Harbour, and the area near the saline effluent discharge. The assessment states that country foods are not harvested in these areas and has concluded that there are no human health risks. However, community members have commented on the potential for country food contamination in these areas, which may indicate that harvesting occurs, and is a point for clarification.

HC recommends to the NIRB to seek the following commitments from AEM to address this uncertainty:

1. Provide recent evidence to confirm whether harvesting occurs in the Melvin Bay area, Itivia Harbour, and in the area near the saline effluent discharge.
2. Use a precautionary approach to manage uncertainty and reduce subsequent risks, which could include:
    a. Using monitoring to confirm assessment predictions; and,
    b. Signage to inform community members and hunters of the location of the saline effluent discharge area and discourage harvesting.

At this time, HC considers this issue unresolved.

HC-TRC #1.2 Key issue: A potential underestimation of health risks due to the misapplication of screening guidelines:

- The HHRA used environmental guidelines protective of aquatic life to determine whether substances in the saline effluent discharge have the potential to adversely affect human health, which does not fully support the assessment conclusion that there are no Chemicals of Potential Concern (COPCs). Moreover, this may underestimate potential health risks if there is exposure to COPCs from the saline effluent discharge.

HC acknowledges that there are no human health based guidelines for the assessment of country foods that can be used for COPC screening for this exposure pathway. If evidence suggests that harvesting does occur within Melvin Bay and the area near the saline effluent discharge (i.e., the response to HC 1.1 harvesting/country foods), HC recommends the NIRB seek the following commitments from AEM:

1. Determine COPCs in the effluent to assess potential human health risks and inform risk management as necessary for the safe consumption of such food sources; and
2. In regards to AEM's commitment to develop a community-based monitoring program for mussels and shellfish, the monitoring program should include country foods identified as being consumed.

At this time, HC considers this issue unresolved.

Mandate, Roles, and Responsibilities

HC is the federal department responsible for helping Canadians maintain and improve their health. The key objective of HC's environmental assessment program is to help prevent, reduce, and mitigate the potential effects of any change to the environment on the health of Indigenous Peoples. At the request of a Responsible Authority, Review Panel, or other jurisdiction conducting an environmental assessment, HC makes available specialist or expert information and knowledge on human health issues related to the potential environmental impacts of a proposed project. These areas include contamination of country foods, human health risk assessments (HHRA), effects of changes to air quality on health, noise impacts, and impacts on drinking and recreational water quality.

In its review, HC examines the baseline assessment and predicted environmental impacts of a project that may affect human health. HC provides comments on potential impacts to human health and assesses the results of any relevant modeling, but relies on other federal departments (e.g., ECCC) to validate the predicted future contaminant levels in air, water or country foods.

HC considers the following aspects of environmental assessment reviews:

- The appropriateness of methodologies used;
- The predicted health impacts and any comparisons to health-based guidelines and standards;
- The measures proposed to mitigate human health impacts;
- The conclusions made concerning human health effects, and the accompanying rationales or justifications; and
- The evidence provided to justify the conclusions, and the scientific defensibility of the rationales for the conclusions regarding potential effects to human health.

HC's comments focus on the accuracy, scientific validity, and completeness of assessments concerning human health effects. HC does not issue any approvals or make any regulatory decisions with respect to this proposed Project.

Specific Comments

Review Comment	**HC-TRC # 1.1**
Subject / Topic	**HHRA - Inconsistent information related to current and future harvesting practices in Melvin Bay, Itivia Harbour, and/or the area proximal to the saline effluent discharge**
References	HHRA Meliadine Waterline Addendum (210112-11MN034-Meliadine Waterline HHRA-IT3E.pdf), Golder Associates Ltd., Section 2.5.2, Pg. 12. Kivalliq Wildlife Board (KWB) Information Request #17 directed to Environment and Climate Change Canada (200925-11MN034-KWB IR-

	IA1E.pdf), KWB, Pg. 11-12 Email correspondences between HC and Agnico Eagle Mines Ltd (AEM). (February 10-24, 2021) Waterline Final Environmental Impact Statement Addendum (FEIS) – Meliadine Mine Technical Comment Responses (201120-11MN034-Agnico Eagle Waterline Addendum TC Responses-IA1E.pdf), AEM, GN-TRC-03 Pg.43 Meliadine Gold Project: Marine Baseline Report Itivia Harbour, Rankin Inlet, NU Final Report, (180619-11MN034-FEIS Addendum Treated Groundwater Effluent Discharge-IA1E.pdf), Nunami Stantec Ltd. Section 2.4, Pg. 2-3 The Nunavut Impact Review Board's (NIRB) Pre-Hearing Conference Decision Report for AEM's "Saline Effluent Discharge to Marine Environment" Project Proposal, Related to the Meliadine Gold Mine Project (210311-11MN034-PHC Decision Report-OT3E.pdf), NIRB, Section 6.15, Pg. 21 Waterline FEIS Addendum 2020 (180619-11MN034-FEIS Addendum Treated Groundwater Effluent Discharge-IA1E.pdf), Appendix F, Section 3, Pg. 399-405
Summary	The HHRA was based on a body of evidence which indicated that harvesting is not occurring in Melvin Bay, Itivia Harbour, and/or in the area proximal to the saline effluent discharge. Based on this understanding, the HHRA concluded that there is no operable country foods exposure pathway to assess. However, during the NIRB's review process, information was introduced and comments were shared that suggest harvesting may occur in this area. If harvesting is occurring in this area, then potential health risks associated with the country foods exposure pathway were not appropriately considered as part of the current HHRA. The NIRB could consider additional measures to address any residual uncertainty and subsequent health risks, which includes existing and proposed monitoring programs and/or appropriate signage to inform local communities. Otherwise, if the NIRB is satisfied that harvesting is not occurring in these areas, the HHRA conclusions regarding country food exposure are appropriate and the uncertainties associated with the country foods exposure pathway may be considered resolved.
Importance of Issue to Impact Assessment	If harvesting is occurring in Melvin Bay, Itivia Harbour, and/or in the area proximal to the saline effluent discharge potential health risks associated with the country foods exposure pathway would not have been appropriately considered as part of the HHRA.
Detailed Review Comment	The HHRA was based on a body of evidence which indicated that that harvesting is not occurring in Melvin Bay, Itivia Harbour, and/or in the area proximal to the saline effluent discharge. This body of evidence was informed by various studies, reports, and oral statements:

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	a) a Nunami Stantec Ltd. final report from 2012 about marine baseline conditions in Itivia Harbour which indicated that "*shellfish harvesting (i.e., mussels and clams) previously occurred along the north shore of Melvin Bay during low tide, however due to warning from the Department of Health and Social Services about shellfish harvesting in close proximity to the community, residents now travel further away to harvest shellfish*"; b) a topographical description of the shoreline area surrounding the saline effluent discharge location in Melvin Bay validating that it is not conducive to nesting grounds for Eider ducks; and, c) a Nanuk Enterprises report from 1999 that stated that Eider duck eggs are gathered on the island of Manilik, located west of Rankin Inlet, as the "*Eiders are more likely to prefer those types of substrates along islands*…". Based on this understanding, the HHRA concluded that there is no operable country foods exposure pathway to assess. During the NIRB's review process there has been evidence presented that harvesting activities likely occur in Melvin Bay. Several Indigenous community members have expressed concern about the potential impacts of the saline effluent discharge on country foods. For example, a community member inquired whether marine country foods from Melvin Bay specifically are safe for consumption during the NIRB's recent Community Roundtable on February 11-12, 2021. Additionally, the KWB Information Request #17, submitted in fall 2020, expressed concerns about the harvesting and consumption of country foods, and suggested the need to monitor harvested country food sources (e.g., eider ducks, and their eggs). Consequently, this has raised questions about possible changes in harvesting activities in Melvin Bay that were not considered in the HHRA. The HHRA's conclusions were based on the understanding that harvesting does not occur in these areas, and, therefore, there are no risks to human health. However, if harvesting is occurring in Melvin Bay, then those risks have not been adequately considered and assessed by AEM.
Recommendation / Request	HC considers this issue unresolved. HC recommends that the NIRB consider seeking the following commitments from AEM to address the uncertainty associated with the country foods exposure pathway: 1. Confirm by providing recent evidence if harvesting practices occur in the Melvin Bay area, Itivia Harbour and/or more specifically in the area proximal to the saline effluent discharge. If harvesting is occurring in this area, then a revised HHRA could characterize potential health risks. 2. Adopt a precautionary approach to reduce uncertainty and subsequent health risks. This could include: a) Using current and proposed monitoring plans to validate modelling predictions of contaminant levels in environmental

	media and potential food sources (e.g., Section 3 of the April 2020 Ocean Discharge Monitoring Plan submitted as part of the FEIS addendum, AEM-KWB Community-Based Monitoring Program for mussels and other shellfish); and b) Implementing risk management measures (e.g., appropriate signage/advisory) intended to discourage harvesting in the area proximal to the saline effluent discharge in Melvin Bay.
Review Comment	**HC-TRC # 1.2**
Subject / Topic	**HHRA – Identification of contaminants of potential concern (COPCs)**
References	HHRA Meliadine Waterline Addendum (210112-11MN034-Meliadine Waterline HHRA-IT3E.pdf), Golder Associates Ltd., Section 2.4.2, Pg. 13-15 PDF Waterline FEIS Addendum 2020 (180619-11MN034-FEIS Addendum Treated Groundwater Effluent Discharge-IA1E.pdf), Appendix F, Section 3, Pg. 399-405 Email correspondences between HC and AEM (February 2021), AEM
Summary	The screening approach used in the HHRA's evaluation of COPCs may not be protective of human health. The guidelines used in the assessment were developed to be protective of aquatic life and are not necessarily protective of human health, and thus should not be relied upon when screening COPCs for assessing risks to human health.
Importance of Issue to Impact Assessment	If harvesting is occurring in Melvin Bay, Itivia Harbour, and/or in the area proximal to the saline effluent discharge, using guidelines based on the protection of aquatic life may not necessarily be protective of human health. Accordingly, the HHRA may not accurately assess potential human health risks.
Detailed Review Comment	If harvesting is occurring in these areas, the use of environmental criteria developed for the protection of aquatic life may not be protective of human health. The use of environmental water quality guidelines in the COPCs screening for the HHRA with respect to human health is inadequate. Specifically, the Canadian Council of Ministers of the Environment Water Quality Guidelines for the Protection of Aquatic Life[2] and the British Columbia Ministry of Environment Working Water Quality Guidelines for Protection of Marine Aquatic Life[3] are intended for the protection of aquatic life and were used to assess COPCs with respect to human health. This misapplication of those guidelines could limit the characterization of potential health risks.
Recommendation / Request	HC considers this issue unresolved. HC acknowledges that there are no human health based guidelines for the assessment of country foods that can be used for COPC screening for this

[2] https://ccme.ca/en/current-activities/canadian-environmental-quality-guidelines

[3] https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-guidelines/approved-wqgs/wqg_summary_aquaticlife_wildlife_agri.pdf

	exposure pathway. If evidence suggests that harvesting does occur within Melvin Bay and the area near the saline effluent discharge (i.e., the response to HC 1.1 harvesting/country foods), HC recommends the NIRB seek the following commitments from AEM: 1. Determine COPCs in the effluent and monitor the country foods being consumed for these COPCs, to assess potential human health risks and inform risk management, as necessary, for the safe consumption of such food sources. 2. In regards to AEM's commitment to develop a community-based monitoring program for mussels and shellfish, with supports from Indigenous communities, the monitoring program should be representative of the species being consumed by people. HC is available to review the monitoring program, upon request.

Conclusion

HC promotes a precautionary approach, including monitoring, to verify assessment assumptions and modelling predictions and the development of additional mitigations to protect human health. The following summarizes HC's recommendations to the NIRB on possible commitments from AEM that would address the remaining uncertainty regarding risks to human health:

HC # 1.1-1:

- Confirm by providing recent evidence if harvesting practices occur in the Melvin Bay area, Itivia Harbour and/or more specifically, in the area proximal to the saline effluent discharge. If harvesting is occurring in this area, then a revised HHRA could characterize potential health risks.

HC # 1.1-2:

- Adopt a precautionary approach to reduce uncertainty and subsequent health risks. This could include:

  a) Using current and proposed monitoring plans to validate modelling predictions of contaminant levels in environmental media and potential food sources (e.g., Section 3 of the April 2020 Ocean Discharge Monitoring Plan submitted as part of the FEIS addendum, AEM-KWB Community-Based Monitoring Program for mussels and other shellfish); and
  b) Implementing risk management measures (e.g., appropriate signage/advisory) intended to discourage harvesting in the area proximal to the saline effluent discharge in Melvin Bay.

If evidence suggests that harvesting does occur within Melvin Bay and the area near the saline effluent discharge (i.e., HC 1.1-1), consideration of the following is also recommended:

HC # 1.2-1:

- Determine COPCs in the effluent and monitor the country foods being consumed for these COPCs to assess potential human health risks and inform risk management, as necessary, for the safe consumption of such food sources.

HC # 1.2-2:

- In regards to AEM's commitment to develop a community-based monitoring program for mussels and shellfish, with supports from Indigenous communities, the monitoring program should be representative of the species being consumed by people. HC is available to review the monitoring program, upon request.

Natural Resources Canada

Executive Summary

NRCan participated in the original NIRB assessment of the Meliadine Gold Mine as a Responsible Minister, due to regulatory responsibilities under the *Explosives Act,* and a source of scientific and technical expertise. NRCan provided technical expertise in the areas of permafrost and terrain sensitivity/stability, hydrogeology, acid rock drainage (ARD), metal leaching and the management of mined materials. NRCan was generally satisfied with the information provided in each of these subjects, but did note that one area of uncertainty was "*saline groundwater inflow to the underground mine where higher flows than predicted are possible although not necessarily anticipated.*"

NRCan is currently participating in the Reconsideration Process for the Project by virtue of the fact that NRCan was a Responsible Minister for the original Meliadine Gold Mine, for which this current process is being considered as an amendment. However, during the initial review of the materials provided for the Project, NRCan found that its areas of expertise were not relevant to the information provided. NRCan confirmed that it would not be fulfilling additional regulatory responsibilities as a result of this Reconsideration. As such, NRCan did not provide a technical review of the materials provided for the Project.

Mandate, Roles, and Responsibilities

NRCan regulates the manufacturing and, depending on jurisdiction, storage of explosives through the *Explosives Act*. NRCan participated in the initial NIRB Review of the Meliadine Gold Mine Project as a department with those jurisdictional responsibilities and, consequently, as a Responsible Minister. NRCan also provided technical expertise in the areas of permafrost and terrain sensitivity/stability, hydrogeology and acid rock drainage, metal leaching and the management of mined materials. During the review of the FEIS of the original Meliadine Gold Mine, NRCan was generally satisfied with the information provided by AEM, but noted there to be the potential for higher saline groundwater inflow to the underground mine than initially predicted during the assessment.

NRCan did an initial review of the Project proposal and determined that NRCan's areas of expertise were not relevant to the technical information provided. Therefore, NRCan did not undertake a technical review.

Specific Comments

NRCan does not have any comments or recommendations to provide.

Conclusion

NRCan performed an initial review of the FEIS Addendum for the Project. During this review, NRCan determined that it does not have expertise relevant to the information provided in the FEIS Addendum and that NRCan would not have a regulatory role for this Process. As such, NRCan did not provide a technical review and does not have any comments or recommendations to provide for this Reconsideration Process.

Transport Canada

Executive Summary

Within this FWS, Transport Canada (TC) provides the NIRB with guidance on potential impacts to navigation associated with the Project. The written submission summarizes TC's mandate, provides an overview of relevant sections of the *Canadian Navigable Waters Act* (*CNWA*), and summarizes TC's TRCs and their status.

TC is a Responsible Minister for the review of the Project as the installation and operation of the new diffuser and submarine discharge pipeline in Melvin Bay will require an approval issued under the *CNWA*. This approval is required because Melvin Bay is part of the Arctic Ocean, which is listed on the schedule of navigable waters under the *CNWA*. Approvals under the *CNWA* may also be required for the twinned waterlines running from the mine to Melvin Bay. This is dependent upon the navigability of the waterways crossed by the waterlines and the final construction details of the crossings.

TC submitted three TRCs, the focus of which was to confirm that AEM would not undertake any work not in compliance with the *CNWA*:

- **TC-TRC #1:** TC identified the issue of the new diffuser and submarine pipeline requiring approval under the *CNWA*.
- **TC-TRC #2**: TC identified the need for AEM to assess the navigability of all waterways that will be crossed by the twinned waterlines. All works in, on, over, under, through or across navigable waters are subject to the *CNWA*.
- **TC-TRC #3:** TC directed AEM to the requirements of the *CNWA* Minor Works Order as the proposed attachment of the twinned waterlines to the Meliadine River Bridge may be a 'minor work' as defined in the *CNWA*.

In its responses to TC's TRCs, AEM confirmed that it is aware of the requirements of the *CNWA* and will obtain any required authorizations prior to starting construction. TC considers its TRCs resolved and is of the opinion that the Project's effects related to navigation and navigational safety can be mitigated through the *CNWA* regulatory process and with AEM's adherence to the provisions of the *CNWA* and the terms and conditions set out in any TC issued authorization. If new information relevant to TC's mandate is presented during the final hearing, TC may amend the analysis and/or recommendations presented in this submission.

During its participation in this assessment, TC has reviewed submissions and evidence provided by Indigenous groups and communities. To date, Indigenous groups and communities have not raised concerns on issues related to TC's mandate or regulatory role during the assessment. TC looks forward to continued dialogue and engagement with the NIRB, AEM, Indigenous communities and organizations, and other interested parties throughout the remainder of the review process.

Mandate, Roles, and Responsibilities

TC is responsible for the Government of Canada's transportation policies and programs. TC develops legislative and regulatory frameworks, such as the *CNWA*, and conducts oversight through legislative, regulatory, surveillance and enforcement activities. While not directly responsible for all aspects or modes of transportation, TC plays a leadership role to ensure that all parts of the transportation system across Canada work together effectively.

TC is a Responsible Minister for the Meliadine Gold Mine operating pursuant to the Meliadine Gold Mine Project Certificate 006, Amendment 001, and has issued approvals for components of the mine

in accordance with the repealed Navigation Protection Act such as the Meliadine River Bridge and the current submarine pipeline and diffuser located in Melvin Bay. Should the Project be approved at the conclusion of the *NuPPAA* environmental assessment, the new diffuser and submarine pipeline will need to be authorized under the *CNWA*.

The proposed new submarine pipeline and diffuser are considered a 'work' under the *CNWA*. In addition, Melvin Bay, as part of the Arctic Ocean, is a Scheduled water under the *CNWA.* As such, AEM must obtain an approval from TC prior to commencing work on the proposed diffuser and submarine pipeline.

With regard to the twinned waterlines running from the mine to Melvin Bay, although the waterways throughout the Project area, other than Melvin Bay, are non-Scheduled waterways under the *CNWA*, one or more of them may be deemed navigable. If a waterway is not navigable as per the definition, then the work proposed is not subject to the *CNWA*. If a waterway is navigable, then AEM, as an owner who proposes to construct, place, alter, remove or decommission a work that is not a major or minor work that could interfere with navigation in a non-Scheduled navigable water, may elect to use the public resolution process instead of the application and approval process. Where the public resolution process is unsuccessful, or with a voluntary application for approval from the owner, TC will review the work for approval.

When the construction, placement, alteration, rebuilding, removal or decommissioning of a work that is not a major or a minor work in any non-Scheduled navigable water will not interfere with navigation, the owner may proceed after depositing information on the public registry as well as publishing a notice. This process is not subject to a comment period.

The crossing of the Meliadine River, if the twinned waterlines will be attached to the bridge structure as proposed, may be a minor work under the CNWA's Minor Works Order. Minor works in any navigable waterway are allowed to proceed without review from TC, so long as the work and/or waterway meet all the criteria and the owner follows the requirements established in the Minor Works Order.

Specific Comments

Review Comment	**TC-TRC #1**
Subject / Topic	**Engineered Diffuser Located in Melvin Bay**
References	FEIS Addendum - Section 2 (Regulatory Regime); p. 4 FEIS Addendum - Section 3.3 (Treated Groundwater Effluent Discharge into Marine Environment Project Description); pp. 12, 17 FEIS Addendum - Section 3.3.1 (Waterline and Diffuser Construction Equipment and Workforce); p. 20 FEIS Addendum - 3.4.3 (Discharge Location); p. 23 FEIS Addendum - Appendix A (Meliadine Mine Bay Diffuser Conceptual Design – Effluent Near Field Modelling) GOC Technical Comments; pp.41-43 AEM Technical Comments Responses; p. 97
Summary	AEM proposes to install and operate a new submarine discharge pipeline and diffuser in Melvin Bay. As Melvin Bay is part of the Arctic Ocean, which

	is a *CNWA* Scheduled waterway, this work requires approval under the *CNWA*.
Importance of Issue to Impact Assessment	Compliance with the *CNWA* will mitigate Project impacts on navigation and navigational safety.
Detailed Review Comment	AEM addressed TC-TRC #1 in its November 20, 2020 TRC Responses. AEM committed to submit a complete application to TC for all works within Melvin Bay and not commence work until TC issues an approval for the works. TC is satisfied that AEM is aware of its responsibilities under the *CNWA* for this part of the Project.
Recommendation / Request	TC considers this issue resolved. If the Project is approved at the conclusion of the *NuPPAA* review, any authorization TC may issue under the *CNWA* for the works in Melvin Bay will be protective of navigation and navigational safety. Project effects' related to navigation and navigational safety can be mitigated through the *CNWA* regulatory process and with AEM's adherence to the provisions of the *CNWA* and the terms and conditions set out in the authorization.
Review Comment	**TC-TRC #2**
Subject / Topic	**Construction of Waterlines Above, Across and Through Waterways**
References	FEIS Addendum - Section 2 (Regulatory Regime); p. 4 FEIS Addendum - Section 3.3 (Treated Groundwater Effluent Discharge into Marine Environment Project Description); p. 12 FEIS Addendum - Figure 4a (Typical Section – Waterline above a Water Stream); p. 15 FEIS Addendum - Appendix D (Roads Management Plan); p. 16 GOC Technical Comments; pp. 43-45 AEM Technical Comments Responses; p. 98
Summary	As part of the Project, twinned 16-inch diameter waterlines will be built within the easement of the existing AWAR and bypass road and be connected to a submarine pipeline and diffuser in Melvin Bay. The waterlines would cross various waterways throughout the Project area, including small streams. If a waterway(s) is navigable, the work, e.g., pipeline crossing, must be done in compliance with the *CNWA*, although may not require approval from TC.
Importance of Issue to Impact Assessment	Compliance with the *CNWA* will mitigate Project impacts on navigation and navigational safety.
Detailed Review Comment	AEM addressed TC-TRC #2 in its November 20, 2020 TRC Responses. AEM committed to completing an assessment of the navigability of the waterways in the Project area before starting construction of the waterlines. AEM also committed to not begin construction of any works that require approval under the *CNWA* until such approval is obtained. TC is satisfied that

	AEM is aware of its responsibilities under the *CNWA* for this part of the Project.
Recommendation / Request	TC considers this issue resolved. Project effects' related to navigation and navigational safety of the crossings of waterways by the twinned waterlines can be mitigated through AEM's adherence to the provisions of the *CNWA* and the terms and conditions outlined in any approvals issued.
Review Comment	**TC-TRC #3**
Subject / Topic	**Construction of Waterlines Across the Meliadine River**
References	FEIS Addendum - Section 2 (Regulatory Regime); p. 4 FEIS Addendum - Section 3.3 (Treated Groundwater Effluent Discharge into Marine Environment Project Description); p. 12 FEIS Addendum - Figure 4a (Typical Section – Waterline above a Water Stream); p. 15 FEIS Addendum – Figure 4b (Support of the Waterline along a Bridge); p.16 GOC Technical Comments; pp. 45-46 AEM Technical Comments Responses; p. 99
Summary	AEM proposes to have the twinned waterlines cross the Meliadine River by attaching them to the Meliadine River Bridge, which was previously approved by TC (TC Navigation Protection Program File # 2010-600573). As presently described by AEM, this is likely a *CNWA* Minor Work and if so, can proceed without review from TC provided AEM follows the requirements of the *CNWA* Minor Works Order.
Importance of Issue to Impact Assessment	Compliance with the *CNWA* and *CNWA* Minor Works Order will mitigate Project impacts on navigation and navigational safety.
Detailed Review Comment	AEM addressed TC-TRC #3 in its November 20, 2020 TRC Responses. AEM confirmed it has reviewed the *CNWA* Minor Works Order and is aware of its requirements. TC is satisfied that AEM is aware of its responsibilities under the *CNWA* for this part of the Project.
Recommendation / Request	TC considers this issue resolved. Project effects related to navigation and navigational safety of the crossing of the Meliadine River by the twinned waterlines can be mitigated by AEM's adherence to the provisions of the *CNWA* and if applicable, the *CNWA* Minor Works Order.

Conclusion

It is TC's position that AEM has satisfactorily addressed the Department's three TRCs. AEM will be required to submit a complete application to TC for all works occurring within Melvin Bay as it is part of the Scheduled waters under the *CNWA*. TC has reviewed the proposed work and believes, based on the information provided by AEM, stakeholder and Indigenous groups, that any impacts to navigation can be mitigated through the Navigation Protection Program regulatory review and approval processes.

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Any *CNWA* authorizations for the Project may only be issued if the Project is approved to proceed at the conclusion of the environmental review process set out in the *NuPPAA*. TC looks forward to continued dialogue and cooperation through the rest of the process with the NIRB, Indigenous groups, AEM, and stakeholders.