AGNICO EAGLE

March 28, 2022 NIRB File No.: 11MN034

Nunavut Planning Commission
PO Box 1797
Iqaluit, NU X0A 0H0

**Re: Request for Conformity Determination: Agnico Eagle Mines Limited Meliadine Extension to Project Certificate No.006**

Dear Ms. Ehaloak,

Agnico Eagle Mines Limited (Agnico Eagle) currently operates the Meliadine Mine in accordance with Nunavut Impact Review Board (NIRB) Project Certificate No.006 and Nunavut Water Board (NWB) Type A Water Licence 2AM-MEL1631. The mine and associated facilities, including the All Weather Access Road (AWAR) and Itivia Harbour, have previously been the subject of positive conformity determinations by the Nunavut Planning Commission (NPC) and referral to the NIRB in June 2011 (Meliadine Mine proposal), and in January 2018 and March 2020 (Saline Effluent Discharge to Marine Environment proposals). Accordingly, associated activities were previously reviewed by the NIRB and NWB. The Project conforms to the Keewatin Regional Land Use Plan (KRLUP). Refer to Section 1 for a history of the Meliadine Mine.

As set out in the enclosed materials, based on additional geological investigations conducted, lessons learned since NIRB approval in 2015, and to continue developing the Meliadine Mine in a sustainable way, Agnico Eagle is seeking approval to add the following activities:

- underground mining and associated saline water management infrastructures at the Pump, F Zone, and Discovery deposits that were previously assessed and approved for open pit mining activities by NIRB in 2015;
- development of a new portal and associated infrastructure in the Tiriganiaq-Wolf mining area to improve access to and expand the existing Tiriganiaq underground mine;
- construction and operation of a windfarm to reduce greenhouse gas emissions;
- use of additional borrow pits and quarries to replace depleted sources and build a road to the windfarm, Tiriganiaq-Wolf mining area, airstrip, road to Discovery, and other deposits; and
- extension of the operation phase (i.e., mine life) by 11 years to 2043.

Agnico Eagle is also seeking approval for the following options/alternatives should it be required:

- construction and operation of an on-site airstrip to increase site access flexibility;
- use of exhausted pits to store tailings or waste rock to complement the current waste management strategy.

Collectively, this is referred to as the Meliadine Extension.

Based primarily on the extension to the mine life and the addition of a windfarm, the NIRB could proceed with a reconsideration of the Project Certificate. Agnico Eagle understands there is a process associated with this and that NIRB has considerable flexibility on how the process may proceed. It is anticipated that limited scope for NIRB consideration will be required in relation to Meliadine Extension and that the file will be subject to more detailed focus at the NWB Type A Water Licence amendment phase. Agnico Eagle wishes to emphasize that the vast majority of the Meliadine Extension was previously assessed (2014) and approved (2015) by the NIRB and should not be included within the scope of any NIRB reconsideration for this Application. Further, Agnico Eagle has not identified any terms and conditions of Project Certificate No.006 which require updating to proceed with the Meliadine Extension components. Monitoring required for the Meliadine Extension can be covered under existing Monitoring and Management Plans.

Agnico Eagle is requesting that the NPC issue a positive conformity determination for the proposed activities as soon as possible, pursuant to section 77(1) of the *Nunavut Planning and Project Assessment Act* (NuPPAA).

## 1. Meliadine Mine Background

Agnico Eagle is proposing an extension (i.e., the Meliadine Extension) to the Approved Meliadine Mine located approximately 25 km north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq region of Nunavut.

NIRB Project Certificate No.006 was issued in 2015 and the environmental assessment of the Meliadine Mine, resulting in the issuance of Project Certificate No.006 in 2015, included approval of a multi-phase approach to development, including mining of Tiriganiaq deposit using open pit and underground mining methods; and mining of the Pump, F Zone, Discovery, and Wesmeg deposits using open pit methods. Type A Water Licence 2AM-MEL1631 issued in 2016 was primarily for the Tiriganiaq deposit and associated infrastructure including, process plant, camp, tailings storage facility, and waste rock storage facilities.

Since the Project Certificate was issued, the Meliadine Mine has been subject to two reconsiderations by NIRB. On January 28, 2019 the Minister provided a positive decision to amend the Project Certificate to include trucking of saline effluent along the AWAR and discharge to Itivia Harbour. On January 31, 2022 the Minister provided a positive decision to amend the Project Certificate to include the conveyance of saline effluent via a waterline along the AWAR (instead of via truck), to accommodate an increased volume of discharge at Itivia.

On June 23, 2021, the Minister approved the Type A Water Licence 2AM-MEL1631 Amendment which included updated total dissolved solids thresholds to Meliadine Lake, increase of annual freshwater consumption, additional laydown area, additional landfarm, updated waste management strategy, construction of access roads to approved deposits, and an updated Interim Closure and Reclamation Plan.

## 2. Scope of Proposed Activities

The geological resources have continued to be explored through ongoing exploration activities and associated studies. Through these, economic extensions, mainly underground, have furthered the Life of Mine (LOM). Those changes to the mine plan translate in an extension of the operation phase by 11 years and optimized waste rock storage facilities.

The continued LOM of Meliadine Extension will support the vision and contribute to the goals of persons enrolled under the Nunavut Agreement. Benefits will accrue to Kivalliq Inuit from the Inuit Impact and Benefit Agreement, employment, training, and business opportunities over the extended operating LOM. Extending the LOM will ensure employment stability and continued business opportunities. Skills learned will continue to be used for an additional decade.

As noted above, the Meliadine Extension includes:

- underground mining and associated saline water management infrastructures at the Pump, F Zone, and Discovery deposits that were previously assessed and approved for open pit mining activities by NIRB;
- development of a new portal and associated infrastructure in the Tiriganiaq-Wolf mining area to improve access to and expand the existing Tiriganiaq underground mine;
- construction and operation of a windfarm to reduce greenhouse gas emissions;
- use of additional borrow pits and quarries to replace depleted sources and build a road to the windfarm, Tiriganiaq-Wolf mining area, airstrip, road to Discovery and other deposits; and
- extension of the operation phase (i.e., mine life) by 11 years to 2043.

Agnico Eagle is also seeking approval for the following options/alternatives, should it be required:

- construction and operation of an on-site airstrip to increase site access flexibility; and
- use of pits to store tailings and waste rock to complement the current waste management strategy.

The Meliadine Extension, other than the windfarm and alternative airstrip and underground mining of approved deposits, was previously assessed by NIRB in 2014. As presented in Figure 1 the activities associated with Meliadine Extension generally fall within the previously assessed and approved area presented in the 2014 FEIS (Project Certificate No.006).

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6990000

6985000

6980000

N

Parallel Lake

Meliadine Lake

# Meliadine Extension

## Site Overview

Date: 12/2/2021
Map Number: MEL-032
Coordinate System: NAD 1983 UTM Zone 15N
Projection: Transverse Mercator
Datum: North American 1983

**Layer**

- NIRB Approved Project Footprint
- Meliadine Extension Footprint
- Mine Infrastructure
- Catchment Boundary Line

0 1 2 3
1:60,000 Km

AGNICO EAGLE ECOLOGIC

Construction is proposed to begin in 2024, following the completion of the NIRB process, receipt of any required licence amendments, authorizations, and permits. In total, the resources will extend the LOM by 11 years to 2043. Closure will occur from 2044 to 2050 and post-closure from 2051 to 2060. Infrastructure and activities at Meliadine Mine that support the approved project will also be extended.

Engagement activities for Meliadine Extension were completed between June to December 2021. Feedback from the engagement activities showed that the community generally had questions around fish and fish habitat, engagement and consultation efforts, and Meliadine Extension Project Description. Most comments were addressed by clarifying the Project Description and explaining existing mitigation measures. Feedback from the engagement activities was also included in the completion of the environmental assessment.

## 3. Potential Environmental Effects

Potential environmental effects and suitable mitigation measures for the Meliadine Extension have been considered and are presented in Attachment A. Agnico Eagle wishes to emphasize that the vast majority of the Meliadine Extension was previously assessed by NIRB in 2014 (as well as the reconsiderations for saline discharge to the marine environment in 2018 and 2020) and should not be included within the scope of any NIRB reconsideration. Mitigation measures described in the FEIS (Agnico Eagle 2014) and FEIS Addenda (Agnico Eagle 2018, 2020) will continue to be applied for Meliadine Extension, where appropriate.

It is Agnico Eagle's position that the existing Terms and Conditions and monitoring programs are robust and adequate to address the changes proposed as part of Meliadine Extension; therefore, an assessment of the proposed activities as an independent project proposal of the Project Certificate would be inappropriate.

Further, the proposed activities will provide positive impacts, environmentally and socially. As part of Project Certificate No.006, Term and Condition 9, a Greenhouse Gas Reduction Plan is required to provide a description of mitigative, and adaptive strategies planned. Moving to wind turbines will reduce greenhouse gases and overall fuel consumption. Socially, Meliadine Extension is anticipated to have a positive effect on the GDP, tax revenues, local business development, jobs and training, incomes, and well-being related to income to spend (as people choose), community contributions, and the continuation of agreements between Agnico Eagle and the communities that are designed to help the communities.

## 4. Closure

It is Agnico Eagle's view that the proposed activities should be permitted to proceed in a timely way to support extension of the Meliadine Mine resources. Accordingly, Agnico Eagle requests that the NPC issue a positive conformity determination as soon as possible. Agnico Eagle will be engaging further with NIRB following the NPC's conformity determination, to confirm any related NIRB processes that may be required to proceed.

If you require any further information in relation to NPC's consideration of this request, please contact the undersigned.

Sincerely,

Jamie Quesnel
Director, Permitting & Regulatory Affairs
Agnico Eagle Mines Limited

**Attachments:**

Attachment A Potential Environmental Impacts and Mitigations for Meliadine Extension

**References:**

Agnico Eagle (Agnico Eagle Mines Limited). 2014. Final Environmental Impact Statement (FEIS) – Meliadine Gold Project, Nunavut. April 2014.

Agnico Eagle. 2018. Meliadine Gold Mine – Final Environmental Impact Statement Addendum, Environmental Assessment of Treated Groundwater Effluent Discharge into Marine Environment, Rankin Inlet. June 2018.

Agnico Eagle. 2020. Meliadine Gold Mine – Final Environmental Impact Statement Addendum, Environmental Assessment of Treated Groundwater Effluent Discharge into Marine Environment, Rankin Inlet. August 2020.

## Attachment A Potential Environmental Impacts and Mitigations for Meliadine Extension

**Table B-1: Atmospheric Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 1 | Air Quality | Mine Site (construction) | Construction activities result in air emissions, which may cause short-term changes in air concentrations.<br>Fuel combustion will result in air emissions, which may contribute to territorial and national greenhouse gas emissions. | Best management practices to control fugitive particulate emissions.<br>Exhaust emissions from non-road vehicles will be managed through purchasing equipment that meet Tier 3 emission standards.<br>Exhaust emissions from non-road vehicles will be managed through regular and routine maintenance of vehicles.<br>SO2 emissions from non-road vehicles and stationary equipment will be reduced through the use of diesel fuel with less than 15 ppm of sulphur. | Minor (bounded by operation effects) | Minor | Construction activities at the windfarm, airstrip and Tiriganiaq-Wolf mining area will temporarily increase the production of fugitive dust and combustion emissions from diesel-powered heavy equipment. However, these emissions are: predicted to be small compared to total emissions from the operational Mine; are temporary (construction phase only) and short in duration; and, of limited spatial extent (e.g., 100's of metres for dust). |
| 2 | Air Quality | Mine Site (decommissioning and reclamation) | Decommissioning activities result in air emissions, which may cause short-term changes in air concentrations.<br><br>Fuel combustion will result in air emissions, which may contribute to territorial and national greenhouse gas emissions. | Best management practices to control fugitive particulate emissions from haul roads and material handling.<br>Sources of particulate emissions at the processing facility are controlled through the use of baghouses.<br>Enclosures are used to reduce fugitive emissions at the processing facility.<br>Exhaust emissions from non-road vehicles will be managed through purchasing equipment that meet Tier 3 emission standards.<br>Exhaust emissions from non-road vehicles will be managed through regular and routine maintenance of vehicles.<br>SO2 emissions from non-road vehicles and stationary equipment will be reduced through the use of diesel fuel with less than 15 ppm of sulphur. | Minor (bounded by operation effects) | Minor | Mine site decommissioning and reclamation activities have already been assessed as part of the 2014 FEIS. No changes proposed as part of Meliadine Extension. |
| 3 | Air Quality | AWAR (construction) | Construction activities result in air emissions, which may cause short-term, localized changes in air concentrations. | Best management practices to control fugitive particulate emissions from construction activities. | Minor | No linkage | AWAR construction effects have already been assessed as part of the 2014 FEIS. No changes proposed as part of Meliadine Extension. |
| 4 | Air Quality | AWAR (operation) | Project vehicles along the AWAR will result in air emissions, which may cause changes in air concentrations and atmospheric deposition rates.<br><br>Fuel combustion will result in air emissions, which may contribute to territorial and national greenhouse gas emissions. | Best management practices to control fugitive particulate emissions from vehicles travelling along the AWAR. | Primary | Minor | No proposed changes to traffic and type of traffic along the AWAR as part of Meliadine Extension. Life of mine will be extended so duration of emissions will be longer. Existing robust mitigation measures will continue to be implemented. Monitoring will continue to be completed to ensure results are within 2014 FEIS predictions and regulatory guidelines. |
| 5 | Air Quality | Rankin Inlet | Activities associated with material receipt, storage, and transfer to the Project will result in air emissions, which may cause short-term, localized changes in air concentrations.<br><br>Fuel combustion will result in air emissions, which may contribute to territorial and national greenhouse gas emissions. | Best management practices to control fugitive particulate emissions.<br>Exhaust emissions from non-road vehicles will be managed through purchasing equipment that meet Tier 3 emission standards.<br>Exhaust emissions from non-road vehicles will be managed through regular and routine maintenance of vehicles.<br>SO2 emissions from non-road vehicles and stationary equipment will be reduced through the use of diesel fuel with less than 15 ppm of sulphur.<br>Best management practices to control fugitive emissions from fuel handling and storage. | Primary | Minor | No change to Rankin Inlet activities (laydown, fuel farm area) proposed as part of Meliadine Extension. No increase in yearly emissions. Life of mine will be extended so duration of emissions will be longer. |
| 6 | Air Quality | Marine Shipping | Marine shipping will result in air emissions, which may contribute to territorial and national greenhouse gas emissions | Marine vessels will remain on-station only as long as required for off-loading delivered materials. | Primary | Minor | No change to marine shipping activities proposed as part of Meliadine Extension. No increase in yearly GHG emissions. Life of mine will be extended so duration of GHG emissions will be longer. |
| 7 | Noise | Mine Site (Construction) | Construction activities will result in noise emissions, which may cause short-term changes in noise levels. | Best management practices to control noise emissions as described in the Noise Abatement and Monitoring Plan.<br>Equipment noise control systems will be maintained. | Minor (Bounded by operation effects) | Minor | The construction phase for the windfarm, airstrip and Tiriganiaq-Wolf mining area will not see a level of activity that is larger than seen during the operations phase (bounded effect). All other construction activities were assessed as part of the 2014 FEIS. |
| 8 | Noise | Mine Site (decommissioning and reclamation) | Decommissioning activities will result in noise emissions, which may cause short-term changes in noise. | Best management practices to control noise emissions as described in the Noise Abatement and Monitoring Plan.<br>Equipment noise control systems will be maintained. | Minor (Bounded by operation effects) | Minor | Mine site decommissioning and reclamation activities have already been assessed as part of the 2014 FEIS. No changes proposed as part of Meliadine Extension. |
| 9 | Noise | AWAR Construction | Construction activities will result in noise emissions, which may cause short-term changes in noise levels. | Best management practices to control noise emissions as described in the Noise Abatement and Monitoring Plan.<br>Equipment noise control systems will be maintained. | Minor (bounded by operation effects) | Minor | AWAR construction effects have already been assessed as part of the 2014 FEIS. No changes proposed as part of Meliadine Extension. |
| 10 | Noise | Marine Shipping | Marine shipping will results in noise emissions, which may cause changes in noise levels | Marine vessels will travel and be anchored at least 3 km from sensitive points of reception. Tugs will remain 1 km from community except when delivering to the port. | Minor (due to large distance to PORs) | Minor | Marine shipping effects have already been assessed as part of the 2014 FEIS. No change to marine shipping activities proposed as part of Meliadine Extension. |

**Table B-2: Permafrost - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 1 | Permafrost | Construction | Degradation of permafrost and terrain (soil and rock) through removal of material. | Minimize depth and footprint area of quarries. Appropriate design of quarries to manage water appropriately and minimize ponding of water within the quarries which will result in a deeper active layer. | Minor | Minor | This pathway has been previously assessed. No changes are proposed to blasting activities that can degrade permafrost as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 2 | Permafrost | Construction | Degradation of permafrost and terrain (soil and rock) through removal of material and ground disturbance. Physical changes to the permafrost in the area of the mine site footprint. | Minimize footprint areas for stripping and removal of material. Minimize ground disturbance by limiting vehicle circulation and by establishing appropriately designed site access roads. | Minor | Minor | This pathway has been previously assessed. No changes are proposed to mine site and open pit footprint areas that can degrade permafrost as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 3 | Permafrost | Construction | Physical changes to permafrost due to temporary building footprint area. | Minimize footprint area and limit exposure time. | No linkage | No linkage | This pathway has been previously assessed. No changes are proposed to temporary buildings that can result in physical changes to permafrost as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 4 | Permafrost | Construction | Use of petroleum products, and maintenance of vehicles may result in hydrocarbon spills infiltrating the active layer. Physical loss of permafrost from latent heat of petroleum and fuel oil stored in tank farm. | Appropriate operations and maintenance procedures in place for the operation of the fuel tank farm. Appropriate re-fueling areas and procedures to minimize and capture spills. A spill plan will be developed for potential chemical spills, including hydrocarbons. Appropriate design and construction of fuel tank farm foundations using thaw-stable materials and to thickness' to promote permafrost growth and stability. Appropriate site maintenance buildings for the repair and maintenance of vehicles will be constructed. | No linkage | No linkage | This pathway has been previously assessed. No changes are proposed to the fuel tank farm as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 5 | Permafrost | Construction | Ponding of water can result in permafrost degradation due to thickening of the active layer. Water diversion and discharge may result in soil erosion. | Minimize ponding of water adjacent to roads, infrastructure, and facilities by promoting drainage and installing appropriate water diversion structures. | Minor | Minor | This pathway has been previously assessed. No changes are proposed to the water management that can result in permafrost degradation as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 6 | Permafrost | Construction | Physical alteration of terrain, soils, and permafrost due to earthworks, facilities construction, and ground disturbance. | Appropriately designed facility to contain and manage sewage. Minimize ground disturbance. Use appropriate engineering design and construction practices for permafrost environments. | Minor | Minor | This pathway has been previously assessed. No changes are proposed to the sewage treatment and disposal that can result in physical alteration of terrain, soils and permafrost as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 7 | Permafrost | Construction | Physical alteration of terrain, soils, and permafrost due to earthworks, facilities construction, and ground disturbance. Physical removal of permafrost soils and rock where stripping is required. Gain of permafrost into waste rock pile foundations. | Minimize stripping of materials. Operate waste management as part of waste rock piles to promote growth of permafrost into the foundation of the piles and promote isolation of waste from the environment. | Minor | Minor | This pathway has been previously assessed. No changes are proposed to the waste management that can result in physical alteration of terrain, soils and permafrost as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 8 | Permafrost | Construction | Stockpiling or clearing of snow can result in the insulation of the active layer and may result in ground instability from thaw subsidence and thickening of the active layer. | Stockpile snow on thaw-stable soils, or in areas that are insensitive to thaw settlement. Use appropriate drainage and water diversion structures to minimize water ponding during thaw. | Minor | Minor | This pathway has been previously assessed. No changes are proposed to the snow clearing and stockpiling that can result in the insulation of the active layer as part of the Meliadine Extension Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 9 | Permafrost | Construction | Physical alteration of terrain, soils, and permafrost due to earthworks, facilities construction, and ground disturbance. Gain of permafrost into structural fills used to construct lay-down pads and unloading areas. | Use appropriate engineering design for structural fills and thickness to promote growth of permafrost into fill materials. | No linkage | No linkage | This pathway has been previously assessed. No changes are proposed to the shipping and unloading that can result in physical alteration of terrain, soils and permafrost as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |

**Table B-2: Permafrost - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 10 | Permafrost | Construction | Physical changes to the permafrost table and active layer in rock and soils beneath and adjacent to the project footprint resulting from ground disturbance during construction. Placement of fill materials during the summer could insulate warm temperatures in subgrade soils leading to permafrost degradation. | The road alignment has been chosen to avoid areas that are ice-rich and, therefore, more susceptible to disturbance. Thaw-stable construction fills will be used to construct the road. Fill thickness' is designed to preserve the permafrost and promote permafrost growth into the thaw-stable road fills. Road fill material will be placed directly over the existing soil layer without cutting, stripping, or grubbing to avoid disturbing the subgrade soils. Placement of much of the road construction materials during winter will minimize disturbance to the permafrost. Only thick drifted snow greater than 1 m thick will be removed before the road fills are placed. | No linkage | No linkage | This pathway has been previously assessed. No changes are proposed to the use of structural fill pads that can result in physical changes to the permafrost as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 11 | Permafrost | Construction | Air emissions and dust deposition on the terrain and soils. Physical changes to the permafrost table and active layer by quarry excavation. Degradation of rock and soil slopes due to annual freeze-thaw processes. | Minimize quarrying activities and use dust suppression measures where appropriate. Active layer and permafrost table will equilibrate to final quarry shape and profile. Minimize depth of quarrying to limit impact on active layer. Appropriate design of quarry walls to promote stability, and to minimize annual slope degradation. Quarries will be shallow excavations and will be closed on completion using current industry standards and practices. | No linkage | No linkage | This pathway has been previously assessed. No changes are proposed to the quarrying and crushing activities that can result in physical changes to the permafrost as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 12 | Permafrost | Construction | Use of quarried materials results in rock and soil volume loss in specific quarry locations, and permafrost degradation. Permafrost degradation due to borrow source and quarry development; development of closed taliks beneath quarry 'lakes' if quarries are improperly graded and drained | Minimize volume of quarried materials required. Quarries will be excavated and sloped for positive drainage. Maximum quarry depths of 3 m are currently planned. The proximity of excavations to watercourses will be to current regulatory standards. Drainage from quarries will not flow directly into any waterbodies or watercourses; drainage will be directed to swales before runoff can enter watercourses. | Minor | Minor | This pathway has been previously assessed. No changes are proposed to the quarrying and crushing activities that can result in permafrost degradation as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 13 | Permafrost | Construction | Physical loss or permanent alteration of terrain, soils, and permafrost within the quarried areas. | Minimize surface area to be quarried. Use current industry standard practices to close quarry sites to minimize rock and soil cuts and restrict where possible the development of quarry lakes by promoting drainage from sites. | Minor | Minor | This pathway has been previously assessed. No changes are proposed to the quarrying and crushing activities that can result in physical loss or permanent alteration of terrain, soils, and permafrost as part of the Meliadine. Extension Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 14 | Permafrost | Construction | Alteration of drainage paths adjacent to quarries may impact permafrost. | Quarries will be excavated and sloped for positive drainage. The proximity of excavations to watercourses will be to current regulatory standards. Drainage from quarries will not flow directly into any water bodies or watercourses; drainage will be directed to swales before runoff can enter watercourses. | No linkage | No linkage | This pathway has been previously assessed. No changes are proposed to the quarrying and crushing activities that may impact permafrost as part of the Meliadine. Extension Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 15 | Permafrost | Operation | Permafrost degradation and retreat during excavation of underground mine. Potential for extension of mining below the base of permafrost. | Appropriate design of underground workings to promote stability and minimize opening dimensions. Appropriate operations of underground mine to minimize introduction of heated air in to mine openings. Use appropriate back filling methods for the placement of fill material. Initial permafrost retreat that may occur during the placement of backfill may be replaced by permafrost re-establishing within the backfilled areas. | Minor | Minor | This pathway has been previously assessed. No changes are proposed to the underground mining that can result in permafrost degradation as part of the Meliadine Extension. Tiriganiaq Underground is presently being mined below the base of the continuous permafrost. The underground excavations act as a sink for groundwater flow during operation, with water induced to flow through the bedrock to the Underground Mine workings, allowing for a temporary localized degradation. The same principle will be applied to the other Underground deposits as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |

**Table B-2: Permafrost - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 16 | Permafrost | Operation | Physical gain of terrain and permafrost within the structural fills used to construct site facilities and infrastructure. Permanent alteration of terrain, soils, and permafrost beneath the structural fills used to construct site facilities and infrastructure. | Use of thaw-stable materials in structural fills to support site facilities and infrastructure. Use appropriate cold regions construction practices for the construction of site facilities and infrastructure to minimize permafrost degradation and to promote permafrost growth. Use of appropriate elevated structures to minimize permafrost degradation. | No linkage | No linkage | This pathway has been previously assessed. No changes are proposed to the mine site facilities that can result in permanent alteration of terrain, soils and permafrost as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 17 | Permafrost | Operation | Physical gain of terrain and permafrost within the waste rock piles. Permanent alteration of terrain, soils, and permafrost beneath the waste rock piles. | Design and use of appropriate water management structures to minimize ponding of water adjacent to waste rock piles. Where possible begin construction during winter months, when active layer is frozen. Place waste rock in lifts to promote freezing of pile. | Minor | Minor | This pathway has been previously assessed. No changes are proposed to the waste rock storage facilities that can result in permanent alteration of terrain, soils and permafrost as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 18 | Permafrost | Operation | Degradation of permafrost due to traffic frequency, vehicle weight. | Use of appropriate structural fills and thickness for site roads, lay-down areas, and pads. | No linkage | No linkage | This pathway has been previously assessed. No changes are proposed to the use of heavy equipment that can result in degradation of permafrost as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 19 | Permafrost | Operation | Physical gain of terrain and permafrost within the structural fills used to construct fuel tank farms. Permanent alteration of terrain, soils, and permafrost beneath the structural fills used to construct fuel tanks farm. Physical loss of permafrost from latent heat of petroleum and fuel oil stored in tank farm. | Appropriate design and construction of fuel tank farm foundations using thaw-stable materials and to thickness to promote permafrost growth and stability, and to limit permafrost degradation. A spill plan will be developed for potential chemical spills, including hydrocarbons. | No linkage | No linkage | This pathway has been previously assessed. No changes are proposed to the fuel tank farm that can result in permanent alteration of terrain, soils and permafrost as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 20 | Permafrost | Operation | Ponding of water, or high volume flow during freshet may degrade frozen ground conditions. | Use appropriate water management methods to avoid water ponding and to control high volume potentially erosive flows. | No linkage | No linkage | This pathway has been previously assessed. No changes are proposed to the water management that can result in degradation of frozen ground conditions as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 21 | Permafrost | Operation | Degradation of permafrost from temporary in-pit water storage | Limit the depth of water and the water storage period in the open pits to reduce permafrost degradation and the formation of a talik below the pit flood level. Consideration of geotechnical integrity of the pit walls and crown pillars together with the pond water pressure head at the pit base. | n/a | Minor | An assessment of water storage in Tiriganiaq 2 Open pit has been completed to evaluate the potential impact to permafrost impacts. The assessment considered permafrost degradation and development and propagation of taliks into submerged base and side slopes of the pit. To reduce the amount of permafrost degradation in the base of the pits, any water storage during operations will be temporary and water will then be drained to allow the base of the pit to be exposed to ambient temperatures. This assessment was submitted as exhibit No. 2 at the Water Licence Amendment Hearing (Tetra Tech 2021d). |
| 22 | Permafrost | Operation | Management of the landfill and landfarm may degrade permafrost. | Use appropriate waste management methods to operate the facilities within the proposed waste rock piles, to promote permafrost growth. Operate the landfill and landfarm in an area of the waste rock pile that will not result in permafrost degradation. | No linkage | No linkage | This pathway has been previously assessed. No changes are proposed to the waste management that can result in degradation of permafrost as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 23 | Permafrost | Operation | Permafrost degradation and thaw settlement in the laydown area due to high traffic circulation and loads. | Minimize traffic circulation in the lay down area. Use thaw-stable materials for the construction of the lay-down area. | No linkage | No linkage | This pathway has been previously assessed. No changes are proposed to the shipping and unloading that can result in degradation of permafrost as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 24 | Permafrost | Operation | Snow clearing and stockpiling may result in insulation of the active layer, incomplete freezing of the active layer, and subsequent thaw settlement. | Stock pile snow on thaw-stable materials. Use snow fencing where appropriate to minimize snow clearing requirements. | Minor | Minor | This pathway has been previously assessed. No changes are proposed to the snow and clearing and stockpiling that may result in insulation of the active layer as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |

**Table B-2: Permafrost - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 25 | Permafrost | Operation | Permafrost degradation and thaw settlement along road edges due to:<br>1. snow drifting and snow accumulation in lee of road;<br>2. snow accumulation along toe of road shoulders from winter plowing; and<br>3. pooling of water and ice lens growth. | Install culverts to promote drainage. Where possible, construct road along exposed ridge lines to reduce potential snow accumulation. Where possible use thaw-stable road fills for construction. Annual road maintenance as required. | Minor | Minor | This pathway has been previously assessed. No changes are proposed to the road use and maintenance activities that can result in permafrost degradation and thaw settlement as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 26 | Permafrost | Closure and Post-closure | Physical gain of terrain and permafrost within the structural fills used to construct project components. Ponding of water adjacent to facilities and infrastructure may degrade permafrost. | Use appropriate demolition methods to remove mine site facilities and to render infrastructure impassible. Water management and appropriate drainage and diversion around facilities; infrastructure graded to promote site drainage. | No linkage | No linkage | This pathway has been previously assessed. No changes are proposed to the demolition and removal of mine site facilities that can result in permafrost degradation as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 27 | Permafrost | Closure and Post-closure | Ponding of water adjacent to site roads may degrade permafrost. Sediment and contaminant releases during removal of culverts can affect downstream soil and terrain. | Roads will be scarified, and water barred to promote drainage of water. Where possible, in-stream work will be limited to when watercourses are not flowing for ephemeral watercourses or when watercourses are frozen. If any of the culverts need to be removed when the watercourses are flowing, the work will be completed late in the summer, and best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management) will be employed. | No linkage | No linkage | This pathway has been previously assessed. No changes are proposed to the AWAR and site road network that can result in permafrost degradation as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 28 | Permafrost | Closure and Post-closure | Transport of contaminants within the active layer | Use appropriate methods for closing the waste management areas (landfill and landfarm) to enhance and promote the growth of permafrost into these materials, and to limit the thickness the active layer. | No linkage | No linkage | This pathway has been previously assessed. No changes are proposed to the waste management that can result in contaminants transportation within the active layer as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |

**Table B-3: Terrestrial Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 1 | Plant populations and communities (including listed plant species and traditional use plants) | Operation and Closure | Residual ground disturbance can cause permanent loss and alteration of vegetation (including listed and traditional use plant species) | Compact infrastructure arrangement is designed to reduce the overall project footprint. Design roads as narrow as possible, while maintaining safe construction and operation practices and meeting legislated requirements. For example, minimum haul road widths are defined under the Mine Health and Safety Act.<br><br>Design and construct roads using thaw-stable construction fills to minimize frost effects. | Minor | Minor | This pathway has been previously assessed. The Meliadine Extension footprint is smaller compared to the mine footprint for the 2014 FEIS. Therefore, permanent loss or alteration of vegetation communities due to the increase of mine footprint is predicted to be minor for Meliadine Extension. The implementation of the Conceptual Closure and Reclamation Plan will reduce the loss of plant communities due to the Meliadine Extension. |
| 2 | Plant populations and communities (including listed plant species and traditional use plants) | Construction and Operation | Loss or alteration of local flows, drainage patterns (distribution), and drainage areas from the Meliadine Extension that can cause changes to vegetation patterns and distribution. | Use of design features (i.e. dams, drainages, dykes and diversions) that reduce changes to local flows, drainage patterns, and drainage areas.<br><br>Shoreline areas susceptible to extensive erosion will be addressed by appropriate erosion protection measures, mitigation measures based on adaptive management, or a combination of both, to reduce erosion and associated re-suspension of fine sediment.<br><br>Where practical, natural drainage patterns will be used to reduce the use of ditches or diversion berms. | Minor | Minor | This pathway has been previously assessed. The implementation of the environmental design features are expected to maintain flows and water levels within the range of baseline conditions and so changes to downstream vegetation are expected to be minor. Thus, the effects on the maintenance of plant population abundance and distribution of plant populations and communities are expected to be negligible. |
| 3 | Plant populations and communities (including listed plant species and traditional use plants) | Construction | Physical loss or alteration of permafrost from the footprint can lead to changes in vegetation ecosystem structure and composition | Compact infrastructure arrangement is designed to reduce the overall project footprint.<br><br>Mine site infrastructure (buildings) foundations will be built on bedrock or pillars to minimize project induced thawing of permafrost.<br><br>Design roads as narrow as possible, while maintaining safe construction and operation practices and meeting legislated requirements. For example, minimum haul road widths are defined under the Mine Health and Safety Act.<br><br>Design and construct roads using thaw-stable construction fills to minimize frost effects. | Minor | Minor | This pathway has been previously assessed. By implementing mitigation practices and environmental design features, the change to permafrost from the Meliadine Extension is anticipated to be minor relative to baseline conditions; therefore, the residual effects to plant populations and communities, and the maintenance of plant population abundance and distribution of plant populations and communities are predicted to be negligible. |
| 4 | Plant populations and communities (including listed plant species and traditional use plants) | Construction and Operation | Air emissions and dust deposition can cause changes to chemical properties of surface water, soils, vegetation, and wetlands<br><br>Dust deposition may cover vegetation and lead to physical and/or physiological damage | Dust will be actively suppressed from roads (water and/or other dust suppressants). Potential use of chemical dust suppressants in accordance with the Environmental Guidance for Dust Suppression published by the Government of Nunavut Department of Environment.<br><br>Enforcing speed limits will assist in reducing dust.<br><br>Road surfaces will be maintained through grading and the addition of granular material.<br><br>Equipment and vehicles will comply with relevant non-road emission criteria at that time of purchase.<br><br>Regular maintenance of equipment and vehicles to meet emission standards. | Minor | Minor | This pathway has been previously assessed. The strongest effects from dust are expected to be generally confined to the immediate area adjacent to the dust source, such as roads, and can be controlled via the proposed design features and mitigations. Particulate matter modelling completed for the 2014 FEIS was conservative, and the Meliadine Extension is not expected to change particulate matter emissions.<br><br>Overall, changes to vegetation (including listed plant species) due to dust deposition and air emissions are anticipated to be minor relative to baseline conditions. Consequently, residual effects to plant population abundance and distribution of plant populations and communities, including listed plant species and the opportunity for traditional and non-traditional use of plant species from dust deposition and air emissions are predicted to be negligible. |

**Table B-3: Terrestrial Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 5 | Plant populations and communities (including listed plant species and traditional use plants) | Construction and Operation | Spills on the mine site or along the AWAR, road to Discovery, and bypass road can affect surface water quality, soils, and vegetation | Equipment will be re-fueled, serviced, and washed away from stream crossings and on impermeable pads wherever possible. There is a wash bay in the maintenance shop.<br><br>Adhere to the Spill Contingency Plan. Ready access to an emergency spill clean-up kit for cleaning-up any spills.<br><br>Hazardous materials and fuel will be stored according to regulatory requirements to protect the environment and workers (i.e., Hazardous Materials Management Plan). As necessary, individuals working on-site and handling hazardous materials will be trained, notably in the Transportation of Dangerous Goods and Hazmat.<br><br>Use of the landfarm to treat soils and rock contaminated by light hydrocarbons.<br><br>Fuel storage tanks situated in a secondary containment area capable of containing 110% of the contents of the largest tank.<br><br>Construction and mining equipment, machinery, and vehicles will be regularly maintained. | No Linkage | No Linkage | This pathway has been previously assessed. The operation of the windfarm will reduce the number of trucks on the road and thus reducing this impact even further. |
| 6 | Plant populations and communities (including listed plant species and traditional use plants) | Construction and Operation | Introduction of non-native plant species can affect native vegetation | Inspection of newly shipped equipment/vehicles and clean as required.<br><br>Enforce DOE guidelines regarding non-native plant species and incorporate protocols for monitoring non-native plant species. | Minor | Minor | This pathway has been previously assessed. Non-native invasive plant species are not a common occurrence in the north, which is in part due to the extreme ecological conditions (e.g., short growing season, harsh winters) that are outside the optimal range for most plant species that are not adapted to Arctic conditions. |
| 7 | Soil and Terrain | Construction and Operation | Loss or alteration of local flows, drainage patterns (distribution), and drainage areas from the Meliadine Extension that can cause changes to terrain and soils | Use of design features (i.e. dams, drainages, dykes and diversions) that reduce changes to local flows, drainage patterns, and drainage areas.<br><br>Shoreline areas susceptible to extensive erosion will be addressed by appropriate erosion protection measures, mitigation measures based on adaptive management, or a combination of both, to reduce erosion and associated re-suspension of fine sediment.<br><br>Where practical, natural drainage patterns will be used to reduce the use of ditches or diversion berms. | Minor | Minor | This pathway has been previously assessed. The implementation of the environmental design features are expected to maintain flows and water levels within the range of baseline conditions and so changes to downstream soil quality is expected to be minor. Thus, the changes to soil quality and soil and terrain quantity and distribution are expected to be negligible. |
| 8 | Soil and Terrain | Construction and Operation | Dewatering of lakes, Project footprint, and diversion of water, may change downstream flows, water levels, and affect soils, vegetation, and wildlife habitat. | Pumped discharge to receiving lake will only occur while water quality discharge criteria are met.<br><br>Pumped discharge will be directed to the lake environment, and not directly to outlets, to attenuate flow changes.<br><br>Shoreline areas susceptible to extensive erosion will be addressed by appropriate erosion protection measures, mitigation measures based on adaptive management, or a combination of both, to reduce erosion and associated re-suspension of fine sediment.<br><br>Where practical, natural drainage patterns will be used to reduce the use of ditches or diversion berms | Minor | Minor | This pathway has been previously assessed. The implementation of the environmental design features are expected to maintain flows and water levels within the range of baseline conditions and so changes to downstream soil quality is expected to be minor. Thus, the changes to soil quality are expected to be negligible. |

**Table B-3: Terrestrial Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 9 | Soil and Terrain | Construction and Operation | Air emissions and dust deposition can cause changes to chemical properties of surface water, soils, vegetation, and wetlands | Dust will be actively suppressed from roads (water and/or other dust suppressants). Potential use of chemical dust suppressants in accordance with the Environmental Guidance for Dust Suppression published by the Government of Nunavut Department of Environment.<br><br>Enforcing speed limits will assist in reducing dust. Road surfaces will be maintained through grading and the addition of granular material.<br><br>Equipment and vehicles will comply with relevant non-road emission criteria at that time of purchase.<br><br>Regular maintenance of equipment and vehicles will be conducted to meet emission standards | Minor | Minor | This pathway has been previously assessed. The strongest effects from dust are expected to be generally confined to the immediate area adjacent to the dust source, such as roads, and can be controlled via the proposed design features and mitigations.<br><br>No changes in emissions were predicted for the Meliadine Extension. Consequently, changes to soil quality from dust deposition and air emissions are predicted to be negligible. |
| 10 | Soil and Terrain | Construction and Operation | Leaching of dissolved metals from waste rock in the waste rock/overburden storage facilities may cause changes to groundwater and surface water quality and soils, which may affect vegetation | Waste rock management procedures developed for potentially problematic waste rock/overburden material.<br>Use of non-acid generating and non-metal leaching material at all watercourses.<br><br>Any PAG or high metal leaching waste rock will be segregated at source and placed into designated areas within the waste rock dumps. PAG and high metal leaching waste rock will be encapsulated with non -PAG rock and low metal leaching rock.<br><br>Over time potential PAG and high metal leaching rock will become permanently frozen with an active cover layer of non-PAG rock. | Minor | Minor | This pathway has been previously assessed. The implementation of the environmental design features are expected to reduce the potential for water to contact metal leaching Mine Rock, tailings, and potentially acid generating rock so changes to downstream soil quality is expected to be minor and changes are expected to be negligible. |
| 11 | Soil and Terrain | Construction and Operation | Long-term seepage from the facilities can change groundwater and surface water quality, which can affect soils and vegetation | TSF has been changed from slurry deposition to dry stack.<br>Landfill will be covered with waste rock pile. | Minor | Minor | This pathway has been previously assessed. For the 2014 FEIS, release of runoff and long-term seepage from the tailings and waste rock storage facilities is not expected result in a detectable change to soils relative to baseline conditions. The Meliadine Extension is not expected to change release of runoff and long-term seepage relative to the 2014 FEIS. |
| 12 | Soil and Terrain | Construction and Operation | Process and potable water requirements during Construction and Operations from the Project may decrease drainage flows and surface water levels, and affect soil, vegetation, wetlands, and wildlife habitat. | Adhere to the Water Management Plan.<br>Contact water will be monitored and managed through the collection ponds.<br><br>Surface runoff and talik water seeping into the open pits will be collected in in-pit sumps. The collected water will be used for dust control and/or managed as contact water (collected, contained, monitored and treated if required to meet water license discharge standards before release).<br><br>Underground water with high salinity will be collected, contained, monitored, treated, and discharged to Itivia Harbour. | No Linkage | No Linkage | This pathway has been previously assessed. No change relative to the 2014 FEIS. |
| 13 | Soil and Terrain | Construction and Operation | Cross-drainage structures for the mine site roads, AWAR, road to Discovery, and bypass road may alter stream hydraulics and geomorphology, and can alter soils, vegetation, and wildlife habitat | Pumped discharge to receiving lake will only occur while water quality discharge criteria are met.<br><br>Shoreline areas susceptible to extensive erosion will be addressed by appropriate erosion protection measures, mitigation measures based on adaptive management, or a combination of both, to reduce erosion and associated re-suspension of fine sediment.<br><br>Where practical, natural drainage patterns will be used to reduce the use of ditches or diversion berms | No Linkage | No Linkage | This pathway has been previously assessed. The AWAR and bypass road have already been built and incorporate cross-drainage structures. Additional culverts will be required along the new proposed access roads to Tiriganiaq-Wolf mining area. The implementation of appropriate cross-drainage structures is expected to result in minor changes to stream flow velocity and levels in the vicinity of the structures relative to baseline conditions and have negligible effects on soil and terrain. |

**Table B-3: Terrestrial Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 14 | Soil and Terrain | Construction and Operation | Spills on the mine site or along the AWAR, road to Discovery, and bypass road can affect surface water quality, soils, and vegetation | Equipment will be re-fueled, serviced, and washed away from stream crossings and on impermeable pads wherever possible. There will be a wash bay in the maintenance shop.<br><br>Adhere to the Spill Contingency Plan.<br><br>Vehicles properly loaded and loads appropriately covered where necessary.<br><br>Hazardous materials and fuel will be stored according to regulatory requirements to protect the environment and workers (i.e., Materials and Waste Management Plan). Individuals working on site and handling hazardous materials will be trained in the Transportation of Dangerous Goods and Hazmat.<br><br>Use landfarm to treat soils and rock contaminated by light hydrocarbons.<br><br>Fuel storage tanks will be situated in a lined and bermed containment area capable of containing 110 per cent of the contents of the largest tank. The storage tanks and fuel-dispensing systems will be constructed in accordance with current regulatory requirements and fire regulations. Fuel will be transported year-round by double-walled tanker trucks to the Meliadine tank farm.<br><br>Construction and mining equipment, machinery, and vehicles will be regularly maintained. | No Linkage | No Linkage | This pathway has been previously assessed. No change relative to the 2014 FEIS. |
| 15 | Soil and Terrain | Construction and Operation | Surface water runoff from the mine facilities area can affect surface water quality, soil, and vegetation | The site Water Management Plan will contain contact water on-site.<br><br>Runoff and seepage from waste rock management areas will be collected in sedimentation ponds located around the perimeter in low topographic points. This water will be monitored for water quality and if necessary transferred to collection ponds for treatment prior to discharge.<br><br>Surface runoff and talik water seeping into the open pits will be collected in in-pit sumps. The collected water will be used for dust control and/or managed as contact water (collected, contained, monitored and treated if required to meet water license discharge standards before release).<br><br>Natural construction materials will be tested before they are used to confirm that they are not potential acid draining or potential sources of metal leaching. | No Linkage | No Linkage | This pathway has been previously assessed. For the 2014 FEIS, release of runoff from the tailings and waste rock storage facilities is not expected result in a detectable change to soils relative to baseline conditions. The Meliadine Extension is not expected to change release of runoff and long-term seepage relative to the 2014 FEIS. |
| 16 | Waterbirds | General construction and operation of mine and supporting infrastructure | Destruction of waterbird nests from increased flows or water levels can increase risk of mortality to individual birds, which can affect waterbird population sizes | Dewatering rates and schedule will be managed such that peak annual water levels will not greatly increase from baseline conditions<br><br>Shoreline areas susceptible to extensive erosion will be addressed by appropriate erosion protection measures to reduce erosion and associated re-suspension of fine sediment.<br><br>Where practical, natural drainage patterns will be used to reduce the use of ditches or diversion berms. | No Linkage | No Linkage | This pathway has been previously assessed. No change to the water management strategy is anticipated based on the current state of the Meliadine Mine. The general water management strategy is to limit flow rates coming in and out of the Meliadine Mine footprint as much as possible to limit impacts on the receiving environment. |

**Table B-3: Terrestrial Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 17 | Waterbirds | General construction and operation of mine and supporting infrastructure | Cross-drainage structures for the mine site roads, AWAR, road to Discovery, and Rankin Inlet bypass road may alter stream hydraulics and geomorphology, and can alter bird habitat | Cross-drainage structures will be designed to prevent overtopping the roadway<br><br>Use of staggered culvert configuration, and removal of snow at the culvert inlet and outlet prior to the freshet to promote drainage during spring thaw and freshet.<br><br>Regular inspection of the road to identify any areas where ponding of water along the road represents a risk, and installing additional culverts to alleviate the risk. | No Linkage | No Linkage | This pathway has been previously assessed. The AWAR and bypass road have already been built and incorporate cross-drainage structures. Additional culverts will be required along the new proposed access roads to Tiriganiaq-Wolf mining area. The implementation of appropriate cross-drainage structures is expected to result in minor changes to stream flow velocity and levels in the vicinity of the structures relative to baseline conditions and have negligible effects on waterbird habitat. |
| 18 | waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Process and potable water requirements for the Project may decrease drainage flows and surface water levels and affect bird habitat | Adhere to the Water Management Plan.<br><br>Contact water will be monitored and managed through the Collection Ponds.<br><br>Surface runoff and groundwater seeping into the open pits will be collected in in-pit sumps. The collected water will be used for dust control and as process water.<br><br>Underground water will be re-cycled for re-use underground, where possible. Excess underground water with high salinity will be treated<br><br>Discharge quality will meet MDMER at end of pipe from CP1 and will meet CCME aquatic life standards within a 100 m wide mixing zone of the diffuser in Meliadine Lake. | No Linkage | No Linkage | This pathway has been previously assessed. Agnico Eagle does not propose changes to the overall authorized total consumption from Meliadine Lake as part of Meliadine Extension, as the estimated needs for Meliadine Extension are within the approved freshwater consumption value. |
| 19 | Waterbirds | General construction and operation of mine and supporting infrastructure | Release of treated mine wastewater and sewage may cause changes to surface water quality and sediment quality affecting aquatic habitat and waterbirds in Meliadine Lake | Adhere to the Water Management Plan.<br><br>Contact water will be monitored and managed through the Collection Ponds.<br><br>Surface runoff and groundwater seeping into the open pits will be collected in in-pit sumps. The collected water will be used for dust control and as process water.<br><br>Underground water will be re-cycled for re-use underground, where possible. Excess underground water with high salinity will be treated<br><br>Discharge quality will meet MDMER at end of pipe and will meet CCME aquatic life standards within a 100 m wide mixing zone of the diffuser in Meliadine Lake.<br><br>The sewage treatment plant for the camp facilities is designed to meet discharge criteria. | No Linkage | No Linkage | This pathway has been previously assessed. Surface contact water will be managed and treated for discharge to Meliadine Lake (through the already approved and built diffuser); this water will meet the MDMER and Type A Water Licence criteria for discharge. The alternative is to minimize discharge to Meliadine Lake and instead discharge this water, in combination with saline water, to Itivia Harbour through the waterline. This alternative was assessed and approved by the Minister through Project Certificate No. 006, Amendment 002 (Agnico Eagle 2020a). This alternative has been further described in the Adaptive Management Plan (Agnico Eagle 2021). Therefore, this pathway is predicted to have no detectable change to bird habitat and the persistence of bird populations. |
| 20 | waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Dust deposition may cover vegetation, change the amount of different quality habitats, and alter movement and behaviour | Dust will be actively suppressed from roads (water and/or other dust suppressants). Potential use of chemical dust suppressants in accordance with the Environmental Guidance for Dust Suppression published by the Government of Nunavut Department of Environment<br><br>Enforcing speed limits will assist in reducing dust. Road surfaces will be maintained through grading and the addition of granular material<br><br>Equipment and vehicles will comply with relevant non-road emission criteria at the time of purchase<br><br>Regular maintenance of equipment and vehicles to meet emission standards | Minor | Minor | This pathway has been previously assessed. The estimated daily traffic along the AWAR for the Meliadine Extension is within the 2014 FEIS.<br><br>The use of an on-site airstrip could reduce dust emissions along the AWAR. |

**Table B-3: Terrestrial Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 21 | waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Air emissions and deposition can cause changes to chemical properties of surface water, soils, vegetation, and wetlands, affecting habitat quality | Equipment and vehicles will comply with relevant emission criteria at the time of purchase.<br><br>Regular maintenance of equipment and vehicles to meet emission standards. | Minor | Minor | This pathway has been previously assessed. The estimated daily traffic along the AWAR for the Meliadine Extension is within the 2014 FEIS.<br><br>The use of an on-site airstrip could reduce cargo and passenger traffic on the AWAR and the bypass road, and result in lower air emissions. |
| 22 | Waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Air emissions and deposition can cause changes to the amount of quality habitats through chemical changes to surface water quality, soils, affecting bird health. | Equipment and vehicles will comply with relevant emission criteria at the time of purchase.<br><br>Regular maintenance of equipment and vehicles to meet emission standards. | No Linkage | No Linkage | This pathway has been previously assessed. The estimated daily traffic along the AWAR for the Meliadine Extension is within the 2014 FEIS.<br><br>The use of an on-site airstrip could reduce cargo and passenger traffic on the AWAR and the bypass road, and result in lower air emissions. |
| 23 | waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Change in energetic costs from disturbance or displacement | Project design will use conventional insulation, baffles and noise suppressors on equipment.<br><br>Stationary equipment will be housed inside buildings. Regular maintenance of equipment to limit noise.<br><br>All employees will be provided with wildlife environmental awareness training. | Minor | Minor | This pathway has been previously assessed. Based on noise modelling, the magnitude of noise effects from the Meliadine Extension are predicted to be generally consistent with the magnitude of noise effects predicted for the 2014 FEIS. |
| 24 | Waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Destruction of nests from Project infrastructure can affect individual mortality, resulting in changes to abundance and distribution of bird populations. | Where possible, clearing of vegetation would take place outside the migratory bird breeding season.<br><br>Where active raptor nests are identified, a nest-specific management plan will be developed to minimize disturbance to nesting activities. | No Linkage | No Linkage | This pathway has been previously assessed. Clearing vegetation outside the migratory bird breeding season is anticipated to avoid destruction of bird nests. |
| 25 | Waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Dewatering of waterbodies, Project footprint, and diversion of water, may change downstream flows, water levels, and affect bird habitat quality | Adhere to the Water Management Plan<br><br>Pumped discharge to receiving waterbody will only occur while water quality discharge criteria are met. Pumped discharge will be directed to the lake environment, and not directly to outlets, to attenuate flow changes.<br><br>Shoreline areas susceptible to extensive erosion will be addressed using appropriate erosion protection measures, mitigation measures based on adaptive management, or a combination of both, to reduce erosion and associated re-suspension of fine sediment<br><br>Where practical, natural drainage patterns will be used to reduce the use of ditches or diversion berms.<br><br>Discharge from dewatering of waterbodies will be sampled regularly to monitor for compliance with discharge criteria, and any water not meeting the criteria will be treated or stored within the Collection Ponds until it meets criteria. | Minor | Minor | This pathway has been previously assessed. Dewatering rates and schedule will be managed so that peak annual water levels, which typically occur in June, do not increase from baseline conditions. Water levels will be increased during the low flow season (i.e., July to October) but are expected to remain below the baseline peak annual water level. |
| 26 | Waterbirds, upland birds (ptarmigan) | General construction and operation of mine and supporting infrastructure | Improved access for harvesting can affect upland bird and waterbird population sizes | Enforce “no hunting, trapping, harvesting or fishing policy” for employees and contractors, while on work rotations.<br><br>Adhere to the Roads Management Plan. | Minor | Minor | This pathway has been previously assessed. No changes are proposed to the AWAR, road to Discovery, and bypass road as approved under the 2014 FEIS. New access roads to the Tiriganiaq-Wolf mining area and windfarm will be constructed. However, these roads will not open areas previously inaccessible to harvesters. |

**Table B-3: Terrestrial Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 27 | Raptors | General construction and operation of mine and supporting infrastructure | Improved access for harvesting can affect raptor population sizes | Enforce “no hunting, trapping, harvesting or fishing policy” for employees and contractors, while on work rotations.<br><br>Adhere to the Roads Management Plan. | No Linkage | No Linkage | This pathway has been previously assessed. No changes are proposed to the AWAR, road to Discovery, and bypass road as approved under the 2014 FEIS. New access roads to the Tiriganiaq-Wolf area and windfarm will be constructed. However, these roads will not open areas previously inaccessible to harvesters. |
| 28 | Waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Spills on the mine site, mine site roads or along the AWAR, road to Discovery, and bypass road can affect bird habitat | Equipment will be re-fueled, serviced, and washed away from stream crossings.<br><br>Adhere to the Spill Contingency Plan | No Linkage | No Linkage | This pathway has been previously assessed. The estimated daily traffic along the AWAR for the Meliadine Extension is within the 2014 FEIS. Therefore the risk of spills along the AWAR is not anticipated to change from the 2014 FEIS. |
| 29 | Waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Spills on the mine site, mine site roads or along the AWARAWAR, road to Discovery, and bypass road can increase risk of mortality to individual birds, which can affect bird population sizes | Ready access to an emergency spill clean-up kit for cleaning up any spills. Vehicles properly loaded and loads appropriately covered where necessary.<br><br>Hazardous materials and fuel will be stored according to regulatory requirements to protect the environment and workers (i.e., Hazardous Materials Management Plan). Individuals working on site and handling hazardous materials will be trained in the Transportation of Dangerous Goods and Hazmat Response.<br><br>Use landfarm treat soils and rock contaminated by light hydrocarbons.<br><br>Fuel storage tanks will be situated in a lined and bermed containment area and the storage tanks and fuel-dispensing systems will be constructed in accordance with current regulatory requirements and fire regulations. Fuel will be transported year-round by double-walled tanker trucks to the Meliadine tank farm.<br><br>Construction and mining equipment, machinery, and vehicles will be regularly maintained. | No Linkage | No Linkage | This pathway has been previously assessed. The estimated daily traffic along the AWAR for the Meliadine Extension is within the 2014 FEIS. Therefore the risk of spills along the AWAR is not anticipated to change from the 2014 FEIS. |
| 30 | Waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Physical hazards on the mine site and collision with vehicles or aircraft causing injury or mortality to individual birds, which can affect population sizes | Adhere to the Roads Management Plan<br><br>The presence of wildlife will be monitored and communicated to site personnel.<br><br>Littering and feeding of wildlife will be prohibited. All employees will be provided with environmental awareness training.<br><br>Visibility markers will be used on tall structures and overhead and guy wires.<br><br>Removal of physical hazards will be part of the Closure and Reclamation Plan.<br><br>Wildlife will be given the right-of-way | Minor | Minor | This pathway has been previously assessed. The estimated daily traffic along the AWAR for the Meliadine Extension is within the 2014 FEIS. Therefore there is no change in the bird-vehicle collision risk.<br><br>The on-site airstrip is anticipated to have 4-6 flights per week during operations and closure. The same number of flights to the Rankin Inlet airstrip was specified in the 2014 FEIS. Therefore there is no change in bird-aircraft collision risk. |

**Table B-3: Terrestrial Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 31 | Waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Surface water runoff from the core mine facilities area can affect surface water quality, soil, vegetation, and bird habitat. | Contact water will be managed on-site in accordance with the Water Management Plan.<br><br>Runoff and seepage from waste rock storage facilities will be collected in sumps located in low topographic points around the perimeter. This water will be monitored for water quality and if necessary transferred to collection ponds before discharge.<br><br>Surface runoff and talik water seeping into the open pits will be collected in in-pit sumps. The collected water will be used for dust control and/or pumped to the tailings storage facility for use as process water<br><br>Sumps will be sized to hold water running off the waste rock storage facilities and the ore stockpiles and open pits.<br><br>Construction materials will be clean and contaminant free.<br><br>Sewage will be treated in the sewage treatment plant. | No Linkage | No Linkage | This pathway has been previously assessed. Surface contact water will be managed and treated for discharge to Meliadine Lake (through the already approved and built diffuser); this water will meet the MDMER and Type A Water Licence criteria for discharge. The alternative is to minimize discharge to Meliadine Lake and instead discharge this water, in combination with saline water, to Itivia Harbour through the waterline. This alternative was assessed and approved by the Minister through Project Certificate No. 006, Amendment 002 (Agnico Eagle 2020a). This alternative has been further described in the Adaptive Management Plan (Agnico Eagle 2021). Therefore, this pathway is predicted to have no detectable change to bird habitat and the persistence of bird populations. |
| 32 | Waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Attraction to the project (e.g. food waste, oil products) may increase human-wildlife interaction and removal of individual animals (e.g. relocation or mortality) which can affect bird population sizes | Most construction will be based out of Rankin Inlet or the Meliadine camp, eliminating the need for temporary camps along the AWAR route.<br><br>Littering and feeding of wildlife will be prohibited. Education and reinforcement of proper waste management practices to all workers and visitors to the site will be provided. Education on the risk associated with feeding wildlife and careless disposal of food wastes and liquids such as coffee and juices will be provided.<br><br>Ongoing review of the efficiency of the waste management program and improvement through adaptive management. Kitchen garbage and waste from dormitories and offices will be incinerated on a daily basis to limit attractions to wildlife.<br><br>Adhere to the Landfill and Waste Management Plan. Wastes associated with mechanical maintenance and repairs will be managed of per the Hazardous Materials Management Plan.<br><br>Adhere to the Terrestrial Environment Management and Monitoring Plan. | Minor | Minor | This pathway has been previously assessed. Environmental design features and management plans should limit attractants to the Meliadine Extension and result in a minor increase in bird mortality risk from human-wildlife interactions (e.g., collisions with vehicles and project infrastructure) relative to baseline conditions. |

**Table B-3: Terrestrial Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 33 | Waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Attraction to the project may increase predator numbers and predation risk, which can affect prey populations | Most construction will be based out of Rankin Inlet or the exploration camp eliminating the need for temporary camps along the AWAR route.<br><br>Littering and feeding of wildlife will be prohibited. Education and reinforcement of proper waste management practices to all workers and visitors to the site. Education on the risk associated with feeding wildlife and careless disposal of food garbage.<br><br>Ongoing review of the efficiency of the waste management program and improvement through adaptive management. Kitchen garbage and waste from dormitories and offices will be routinely incinerated to limit attractions to wildlife.<br><br>Skirt all buildings and stairs to the ground to limit opportunities for use as shelter.<br><br>Adhere to the Landfill and Waste Management Plan. Wastes associated with mechanical maintenance and repairs will be managed of per the Hazardous Materials Management Plan.<br><br>Adhere to the Terrestrial Environment Mitigation and Monitoring Program.<br><br>Active bird nests on infrastructure will be quarantined from activity, monitored and reported to regulators. | Minor | Minor | This pathway has been previously assessed. Agnico Eagle does not propose changes to the on-site landfill located within WRSF1, and will continue to progressively fill in an orderly manner. A new landfill at Discovery will be added as part of Meliadine Extension. Environmental design features and management plans should limit attractants to the Meliadine Extension and result in a minor increase in bird mortality risk from predation relative to baseline conditions. |
| 34 | Upland birds, raptors | General construction and operation of mine and supporting infrastructure | Attraction of birds to Project facilities and infrastructure for roosting and nesting sites can affect mortality and productivity | Most construction of the Project will be based out of Rankin Inlet or the exploration camp eliminating the need for temporary camps along the AWAR route.<br><br>Littering and feeding of wildlife will be prohibited. Education and reinforcement of proper waste management practices to all workers and visitors to the site. Education on the risk associated with feeding wildlife and careless disposal of food garbage.<br><br>Ongoing review of the efficiency of the waste management program and improvement through adaptive management. Kitchen garbage and waste from dormitories and offices will be routinely incinerated to limit attractions to wildlife.<br><br>Skirt all buildings and stairs to the ground to limit opportunities for use as shelter.<br><br>Adhere to the Landfill and Waste Management Plan. Wastes associated with mechanical maintenance and repairs will be managed of per the Hazardous Materials Management Plan.<br><br>Adhere to the Terrestrial Environment Mitigation and Monitoring Program.<br><br>Active bird nests on infrastructure will be quarantined from activity, monitored and reported to regulators | Minor | Minor | This pathway has been previously assessed. Monitoring of infrastructure and facilities for raptor nests and the implementation of deterrents or limiting activities around nests that are deemed to be in a safe location are likely to limit effects on bird survival or productivity. |
| 35 | Waterbirds | General construction and operation of mine and supporting infrastructure | Landing or use of Collection Ponds may increase bird mortality through exposure to contaminants and impact waterbird health | Collections Ponds will be monitored for use by birds as part of the Terrestrial Environment Mitigation and Monitoring Program<br><br>Hydrocarbon contaminated snow will be treated at the landfarm.<br><br>Collection Ponds will be monitored for water quality | Minor | Minor | This pathway has been previously assessed. Experience from existing mines in NT and NU (such as at the Meadowbank, Snap Lake, Diavik, Giant, and Con mines) indicates that waterbirds do not often use water management ponds, TSF, and ditches; likely because these waterbodies are typically small, are located in areas of high activity, and have little forage and nesting cover (De Beers 2010; Gebauer et al. 2012; DDMI 2012). Further, there is an abundance of waterbodies in the RSA; therefore the risk of waterbirds landing on collection ponds or other water management areas is considered low. |

**Table B-3: Terrestrial Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 36 | Waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Disruption or alteration of migration routes from the presence of the mine or from mine-related activities | Compact layout of the surface facilities within local watersheds will limit the area that is disturbed by construction and operation.<br><br>Project design will use conventional insulation, baffles and noise suppressors on equipment.<br><br>Stationary equipment will be housed inside buildings.<br><br>Regular maintenance of equipment to limit noise. | No Linkage | Minor | Wind turbines may represent an obstacle to migrating birds resulting in altered migratory flight paths (Drewitt and Langston 2006). Masden et al. (2009) found changes in flight trajectories in migrating eiders, which displayed curvature in flight paths near wind farms. However, based on an avian energetic model, additional distance travelled as a consequence of the wind farm was trivial compared to the total cost of a migratory flight (Masden et al. 2009). Based on a literature review, Drewitt and Lagston (2006) concluded that barrier effects associated with windfarms do not have significant impacts on populations. The windfarm at the Meliadine Extension will be relatively small, consisting of 11 turbines, such that any disruption of bird migration routes to avoid it are expected to result in minimal additional energy expenditure and consequently will only have a minor effect on survival and reproduction. |
| 37 | Waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Uptake of metals by wildlife through ingestion of tailings and dust on surface water, soils and vegetation can affect bird health | Adhere to the Mine Waste Management Plan<br><br>Any PAG or high metal leaching waste rock will be segregated at source and placed into designated areas within the waste rock storage facilities.<br><br>If not suitable for construction, overburden will be stored with the waste rock storage facilities.<br><br>Tailings deposition is designed to limit dust generation. | No Linkage | No Linkage | This pathway has been previously assessed. No change relative to the 2014 FEIS. |
| 38 | waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Leaching of dissolved metals from waste rock in the waste rock storage facilities may cause changes to groundwater and surface water quality and soils, which may affect bird habitat | Design waste rock management procedures for potentially problematic waste rock material.<br><br>Use of non-acid generating and non-metal leaching material at all watercourses.<br><br>Any PAG or high metal leaching waste rock will be segregated at source and placed into designated areas within the waste rock storage facilities.<br><br>PAG and high metal leaching waste rock will be encapsulated with non-PAG rock and low metal leaching rock.<br><br>Over time potential PAG and high metal leaching rock will become permanently frozen with an active cover layer of non-PAG rock. | No Linkage | No Linkage | This pathway has been previously assessed. No change relative to the 2014 FEIS. |
| 39 | waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Vertical and lateral seepage from facilities may cause changes to groundwater and surface water quality and soils, which may affect bird habitat | Use landfarm to treat soils and rock contaminated by light hydrocarbons.<br><br>Landfill will not contain any putrescible organic matter so seepage is not expected. | No Linkage | No Linkage | This pathway has been previously assessed. No change relative to the 2014 FEIS. |
| 40 | waterbirds, upland birds, raptors | General construction and operation of mine and supporting infrastructure | Water quality following closure may affect bird health | Sewage treatment plant will remain active during active closure.<br><br>PAG and high metal leaching potential waste rock will be stored in designated areas and will be encapsulated with non-PAG and low metal leaching potential waste rock<br><br>Implement the Conceptual Closure and Reclamation Plan. | No Linkage | No Linkage | This pathway has been previously assessed. No change relative to the 2014 FEIS. |

**Table B-3: Terrestrial Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 41 | Polar Bear | Mine infrastructure footprint (e.g., open pit, site roads) Project Access Road, Rankin Inlet Infrastructure, Meliadine Extension Infrastructure | Direct loss and fragmentation of terrestrial wildlife habitat | Compact plant arrangement is designed to reduce the overall project footprint.<br><br>Design roads as narrow as possible, while maintaining safe construction and operation practices, and meeting legislated requirements. For example, minimum haul road widths are defined under the Mine Health and Safety Act, SNWT (Nu). | Minor | Minor | This pathway has been previously assessed. The 2014 FEIS was predicted to cause a minor change in the amount and configuration of habitat for polar bears relative to baseline conditions. The estimated decrease in habitat for some individuals is expected to have a negligible residual effect on the abundance and distribution of the Western Hudson Bay polar bear population, and continued opportunity for traditional and non-traditional use of wildlife. The Meliadine Extension is not expected to cause significant decrease in the amount of polar bear habitat available relative to baseline conditions. |
| 42 | Caribou, Wolf, Polar Bear | Water Management (dams, drainage, diversion, intake, discharge and dewatering) | Cross-drainage structures for the mine site roads, AWAR, road to Discovery, and Rankin Inlet bypass road may alter stream hydraulics and geomorphology, and can alter wildlife habitat | Cross-drainage structures will be designed and constructed such that structures will not create a hydraulic barrier and will convey peak flows.<br><br>Use of staggered culvert configuration, and removal of snow at the culvert inlet and outlet prior to the freshet to promote drainage during spring thaw and freshet.<br><br>Regular inspection of the road to identify any areas where ponding of water along the road represents a risk, and installing additional culverts to alleviate the risk. | No Linkage | No Linkage | This pathway has been previously assessed. The AWAR and Bypass road have already been built and incorporate cross-drainage structures. Additional culverts will be required along the new proposed access roads to the Tiriganiaq-Wolf, windfarm, and airstrip. The implementation of appropriate cross-drainage structures is expected to result in minor changes to stream flow velocity and levels in the vicinity of the structures relative to baseline conditions and have negligible effects on wildlife habitat. |
| 43 | Caribou, Wolf, Polar Bear | Water Management (dams, drainage, diversion, intake, discharge and dewatering) | Dewatering of waterbodies, Meliadine Mine footprint, and diversion of water, may change downstream flows, water levels, and affect wildlife habitat. | Shoreline areas susceptible to extensive erosion will be addressed by appropriate erosion protection measures to reduce erosion and associated re-suspension of fine sediment.<br><br>Adhere to the Water Management Plan.<br><br>Discharge from dewatering of waterbodies will be sampled regularly to monitor for compliance with discharge criteria, and any water not meeting the criteria will be treated or stored within the Collection Ponds until it meets criteria. | Minor | Minor | This pathway has been previously assessed. Diversion of water related to the 2014 FEIS was expected to be minor and have no impact on distribution or abundance of wildlife populations, due to implementation of appropriate dewatering rates and schedules. The Meliadine Extension is not expected to cause significant changes to the water management strategy for the Meliadine Mine. |
| 44 | Caribou, Wolf, Polar Bear | Water Management (dams, drainage, diversion, intake, discharge and dewatering) | Process and potable water requirements for the Meliadine Mine may decrease drainage flows and surface water levels, and affect wildlife habitat | Adhere to the Water Management Plan.<br><br>Contact water will be monitored and managed through the Collection Ponds.<br><br>Surface runoff and groundwater seeping into the open pits will be collected in in-pit sumps. The collected water will be used for dust control and as process water.<br><br>Underground water will be re-cycled for re-use underground, where possible. Underground water with high salinity will be treated.<br><br>Discharge quality will meet MDMER at end of pipe and will meet CCME aquatic life standards within a 100 m radius mixing zone of the diffuser in Meliadine Lake.<br><br>The sewage treatment plant for the camp facilities is designed to meet the Nunavut effluent guidelines for wastewater discharge. | No Linkage | No Linkage | This pathway has been previously assessed. The mine withdraws freshwater from Meliadine Lake for potable water, underground operations and plant operations. Water level changes due to freshwater requirements are expected to be negligible, and therefore have minimal effects on wildlife habitat. The Meliadine Extension is not expected to cause significant changes to the water level changes from the 2014 FEIS. |
| 45 | Caribou, Wolf, Polar Bear | General construction and operation of mine and supporting infrastructure | Dust deposition may cover vegetation, change the amount of different quality habitats, and alter movement and avoidance behaviour of wildlife. | Dust will be actively suppressed from roads (water and/or other dust suppressants). Potential use of chemical dust suppressants in accordance with the Environmental Guidance for Dust Suppression published by the Government of Nunavut Department of Environment.<br><br>Enforcing speed limits will assist in reducing dust. Road surfaces will be maintained through grading and the addition of granular material. | Minor | Minor | This pathway has been previously assessed. Air quality modelling for the 2014 FEIS found that dust deposition would result in minor and localized changes to soils and vegetation, with open pits and haul roads as primary dust sources. The Meliadine Extension does not include additional haul roads, and underground mining is used where possible, rather than open pits. Therefore the Meliadine Extension is not expected to cause significant changes to dust deposition compared to the 2014 FEIS. |

**Table B-3: Terrestrial Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 46 | Caribou, Wolf, Polar Bear | General construction and operation of mine and supporting infrastructure | Air emissions and deposition can cause changes to chemical properties of surface water, soils, vegetation, wetlands, and wildlife habitat | Equipment and vehicles will comply with relevant emission criteria at the time of purchase.<br><br>Regular maintenance of equipment and vehicles to meet emission standards. | Minor | Minor | This pathway has been previously assessed. Air emission assessment for the 2014 FEIS found that changes to vegetation and soil associated with air emissions would be minor and localized. The estimated daily traffic along the AWAR for the Meliadine Extension is within the 2014 FEIS. The use of an on-site airstrip could reduce cargo and passenger traffic on the AWAR and the bypass road, and result in lower air emissions. |
| 47 | Caribou, Wolf, Polar Bear | General construction and operation of mine and supporting infrastructure | Air emissions and deposition can cause changes to the amount of quality habitats through chemical changes to surface water quality, soils, affecting wildlife health | Equipment and vehicles will comply with relevant emission criteria at the time of purchase.<br><br>Regular maintenance of equipment and vehicles to meet emission standards. | No Linkage | No Linkage | This pathway has been previously assessed. Air emission assessment for the 2014 FEIS included a wildlife health risk assessment to evaluate the potential adverse effect to individual animal health associated with exposure to chemicals from the 2014 FEIS. Health effects to wildlife as a result of the 2014 FEIS were not expected. Traffic along the AWAR is not expected to increase for the Meliadine Extension, and use of an on-site airstrip could reduce cargo and passenger traffic on the AWAR and the bypass road, resulting in lower air emissions. |
| 48 | Caribou, Wolf, Polar Bear | General construction and operation of mine and supporting infrastructure | Change in wildlife energetic costs from disturbance or displacement | Project design will use conventional insulation, baffles and noise suppressors on equipment. Stationary equipment will be housed inside buildings.<br><br>Regular maintenance of equipment to limit noise.<br><br>All employees will be provided with wildlife environmental awareness training. | Minor | Minor | This pathway has been previously assessed. Noise assessment completed for the Meliadine Extension found that noise effects from the Meliadine Extension would be comparable to the 2014 FEIS. Increased noise associated with the airstrip would be intermittent. Therefore the Meliadine Extension is not expected to cause significant changes to noise compared to the 2014 FEIS. |
| 49 | Polar Bear | General construction and operation of mine and supporting infrastructure | Sensory disturbance can change the amount of different quality habitats, and alter polar bear movement and behaviour (distribution) | All employees will be provided with wildlife environmental awareness training.<br><br>Project design will use conventional insulation, baffles and noise suppressors on equipment.<br><br>Stationary equipment will be housed inside buildings. Regular maintenance of equipment to limit noise. | Minor | Minor | This pathway has been previously assessed. Environmental design features and the TEMMP are implemented for the Meliadine Mine to limit olfactory and auditory disturbance to large carnivores, which should result in minor changes to habitat quality relative to baseline conditions. Only a small proportion of the Western Hudson Bay polar bear population in the RSA should be affected by sensory disturbance from the Meliadine Extension. The same environmental design features, mitigation, and monitoring will be implemented for the Meliadine Extension. Therefore, the Meliadine Extension is not expected to increase sensory disturbance to polar bears compared to the 2014 FEIS. |
| 50 | Polar Bear | General construction and operation of mine and supporting infrastructure | Improved access for harvesting polar bear can affect population sizes | Enforce “no hunting, trapping, harvesting or fishing policy” for employees and contractors.<br><br>Access to the mine site will be controlled (gated); public vehicles (cars, trucks) allowed only with special authorization.<br><br>Wildlife will be provided the right-of-way.<br><br>All roads will be decommissioned and scarified during closure. | Minor | Minor | This pathway has been previously assessed. Environmental design features and management plans were expected to limit changes in harvest patterns to polar bears resulting from increased access related to the 2014 FEIS. Therefore, this pathway is predicted to have a negligible residual effect on the maintenance of the Western Hudson Bay polar bear subpopulation and the continued opportunity for traditional and non-traditional use. The Meliadine Extension does not include development of roads that would increase access to polar bear populations. Therefore, the Meliadine Extension is not expected to increase polar bears harvest rates compared to the 2014 FEIS. |
| 51 | Caribou, Wolf, Polar Bear | General construction and operation of mine and supporting infrastructure | Spills on the mine site or along the AWAR, road to Discovery, and bypass road can affect surface water quality, soils, vegetation, and wildlife habitat | Equipment will be re-fueled, serviced, and washed away from stream crossings and on impermeable pads wherever possible. There is a wash bay in the maintenance shop.<br><br>Adhere to the Spill Contingency Plan. | No Linkage | No Linkage | This pathway has been previously assessed. The estimated daily traffic along the AWAR for the Meliadine Extension is within the 2014 FEIS. Therefore the risk of spills along the AWAR is not anticipated to change from the 2014 FEIS. |

**Table B-3: Terrestrial Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 52 | Caribou, Wolf, Polar Bear | General construction and operation of mine and supporting infrastructure | Spills on the mine site or along the AWAR, road to Discovery, and bypass road can increase risk of mortality to individual animals, which can affect wildlife population sizes | Ready access to an emergency spill clean-up kit for cleaning up any spills.<br><br>Hazardous materials and fuel will be stored according to regulatory requirements to protect the environment (i.e., Hazardous Materials Management Plan). As necessary, individuals working on site and handling hazardous materials will be trained, notably in the Transportation of Dangerous Goods and Hazmat.<br><br>Use landfarm to treat soils contaminated by light hydrocarbons.<br><br>Fuel storage tanks will be situated in a secondary containment area capable of containing 110% of the contents of the largest tank. The storage tanks and fuel-dispensing systems will be constructed in accordance with current regulatory requirements and National Fire Code. Fuel reconciliation will be conducted and structural integrity will be routinely inspected.<br><br>Construction and mining equipment, machinery, and vehicles will be regularly maintained. | No Linkage | No Linkage | This pathway has been previously assessed. The estimated daily traffic along the AWAR for the Meliadine Extension is within the 2014 FEIS. Therefore the risk of spills along the AWAR is not anticipated to change from the 2014 FEIS. |
| 53 | Caribou, Wolf, Polar Bear | General construction and operation of mine and supporting infrastructure | Physical hazards on the mine site and collision with vehicles or aircraft, causing injury or mortality to individual animals, which can affect population sizes | Speed limits will be established.<br><br>Access will be controlled when caribou are present at the mine site.<br><br>The presence of wildlife will be monitored and communicated to site personnel.<br><br>Littering and feeding of wildlife will be prohibited. All employees will be provided with wildlife environmental awareness training.<br><br>Removal of physical hazards will be part of the Closure and Reclamation Plan.<br><br>Wildlife will be given the right-of-way. | Minor | Minor | This pathway has been previously assessed. The estimated daily traffic along the AWAR for the Meliadine Extension is within the 2014 FEIS. Therefore there is no change in the wildlife-vehicle collision risk. The on-site airstrip is anticipated to have 4-6 flights per week during operations and closure. Additional mitigation and monitoring will be implemented to avoid take-off and landing of flights when caribou are within 1 km of the airstrip. |
| 54 | Caribou, Wolf, Polar Bear | General construction and operation of mine and supporting infrastructure | Surface water runoff from the core mine facilities area can affect surface water quality, soil, vegetation, and wildlife habitat | Contact water will be managed on-site in accordance with the Water Management Plan.<br><br>Runoff and seepage from waste rock storage facilities will be collected in sumps located in low topographic points around the perimeter. This water will be monitored for water quality and if necessary transferred to the mine collection pond before discharge.<br><br>Natural construction materials will be tested before they are used to confirm that they are not potential acid draining or potential sources of metal leaching. | No Linkage | No Linkage | This pathway has been previously assessed. Surface contact water will be managed and treated for discharge to Meliadine Lake (through the already approved and built diffuser); this water will meet the MDMER and Type A Water Licence criteria for discharge. The alternative is to minimize discharge to Meliadine Lake and instead discharge this water, in combination with saline water, to Melvin Bay through the waterline. This alternative was assessed and approved by the Minister through Project Certificate No. 006, Amendment 002 (Agnico Eagle 2020). Therefore, this pathway is predicted to have no detectable change to wildlife habitat and wildlife populations. |

**Table B-3: Terrestrial Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 55 | Wolf, Polar Bear | General construction and operation of mine and supporting infrastructure | Attraction to the Meliadine Mine may increase human-carnivore interactions and removal of individual animals (e.g., relocation or mortality), which can affect wildlife population sizes | Most construction of the Project will be based out of Rankin Inlet or the Meliadine camp, eliminating the need for temporary camps along the AWAR route.<br><br>Littering and feeding of wildlife will be prohibited. Education and reinforcement of proper waste management practices to all workers and visitors to the site. Education on the risk associated with feeding wildlife and careless disposal of food wastes and liquids such as coffee and juices.<br><br>Ongoing review of the efficiency of the waste management program and improvement through adaptive management. Kitchen garbage and waste from dormitories and offices will be incinerated on a daily basis to limit attractions to wildlife.<br><br>Skirt all buildings and stairs to the ground to limit opportunities for use as shelter.<br><br>Adhere to the Landfill and Waste Management Plan. Wastes associated with mechanical maintenance and repairs will be managed of per the Hazardous Materials Management Plan.<br><br>Adhere to the Terrestrial Environment Management and Monitoring Plan. Wildlife will have the right-of-way. | Minor | Minor | This pathway has been previously assessed. Environmental design features and management plans were expected to limit attractants to the Meliadine Mine. This should result in a minor increase in wildlife mortality risk from human–wildlife interactions relative to baseline conditions. The same environmental design features and management plans will be implemented for the Meliadine Extension, therefore the Meliadine Extension is not expected to increase human-carnivore interactions relative to the 2014 FEIS. |
| 56 | Caribou | General construction and operation of mine and supporting infrastructure | Attraction to the Meliadine Mine may increase predator numbers and predation risk which can affect prey population sizes | All construction personnel for the Project will be based out of Rankin Inlet or the Meliadine camp eliminating the need for temporary camps along the AWAR route.<br><br>Littering and feeding of wildlife will be prohibited. Education and reinforcement of proper waste management practices to all workers and visitors to the site. Education on the risk associated with feeding wildlife and careless disposal of food wastes and liquids such as coffee and juices.<br><br>Ongoing review of the efficiency of the waste management program and improvement through adaptive management. Kitchen garbage and waste from dormitories and offices will be incinerated on a daily basis to limit attractions to wildlife.<br><br>Skirt all buildings and stairs to the ground to limit opportunities for use as shelter.<br><br>Adhere to the Landfill and Waste Management Plan. Wastes associated with mechanical maintenance and repairs will be managed of per the Hazardous Materials Management Plan.<br><br>Adhere to the Terrestrial Environment Management and Monitoring Plan. Wildlife will have the right-of-way. | Minor | Minor | This pathway has been previously assessed. Environmental design features and management plans were expected to limit attractants to the Meliadine Mine. This should result in a minor increase in predation on wildlife and/or birds, relative to baseline conditions. The same environmental design features and management plans will be implemented for the Meliadine Extension, therefore the Meliadine Extension is not expected to increase predation risk relative to the 2014 FEIS. |
| 57 | Caribou, Wolf, Polar Bear | Operation of Mine and supporting infrastructure | Uptake of metals by wildlife through ingestion of tailings and dust on surface water, soils and vegetation can affect health of individual animals, which can affect wildlife population sizes | Adhere to the Mine Waste Management Plan.<br><br>Any PAG or high metal leaching waste rock will be segregated at source and placed into designated areas within the waste rock storage facilities. If not suitable for construction, overburden will be stored with the waste rock storage facility.<br><br>Tailings deposition will be designed to limit dust generation. | No Linkage | No Linkage | This pathway has been previously assessed. For the 2014 FEIS, there were no contaminants of potential concern (COPC) identified in soil, sediment or surface water for further evaluation in the environmental risk assessment. As such, the environmental risk assessment did not proceed beyond the chemical screening stage of the problem formulation for wildlife. This indicates that adverse health effects to wildlife as a result of the 2014 FEIS are not expected. The Meliadine Extension is not expected to change presence of COPC relative to the 2014 FEIS. |

**Table B-3: Terrestrial Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 58 | Caribou, Wolf, Polar Bear | Operation of Mine and supporting infrastructure | Leaching of dissolved metals from waste rock may cause changes to groundwater and surface water quality and soils, which may affect vegetation and wildlife habitat | Design waste rock management procedures for potentially problematic waste rock material.<br><br>Use of non-acid generating and non-metal leaching material at all watercourses.<br><br>Any PAG or high metal leaching waste rock will be segregated at source and placed into designated areas within the waste rock storage facilities. PAG and high metal leaching waste rock will be encapsulated with non -PAG rock and low metal leaching rock.<br><br>Over time potential PAG and high metal leaching rock will become permanently frozen beneath an active cover layer of non-PAG rock. | No Linkage | No Linkage | This pathway has been previously assessed. For the 2014 FEIS, release of runoff and long-term seepage from the tailings and waste rock storage facilities, as well as leachate from waste rock was expected to result in no detectable change to wildlife habitat outside of the 2014 FEIS footprint area relative to baseline conditions. The Meliadine Extension is not expected to change release of runoff and long-term seepage relative to the 2014 FEIS. |
| 59 | Caribou, Wolf, Polar Bear | Operation of Mine and supporting infrastructure | Vertical and lateral seepage from facilities may cause changes to groundwater and surface water quality and soils, which may affect vegetation and wildlife habitat | Use landfarm to treat soils and rock contaminated by light hydrocarbons.<br><br>Landfill will not contain any putrescible organic matter so seepage is not expected. | No Linkage | No Linkage | This pathway has been previously assessed. For the 2014 FEIS, release of runoff and long-term seepage from the tailings and waste rock storage facilities, as well as leachate from waste rock was expected to result in no detectable change to wildlife habitat outside of the 2014 FEIS footprint area relative to baseline conditions. The Meliadine Extension is not expected to change release of runoff and long-term seepage relative to the 2014 FEIS. |
| 60 | Caribou, Wolf, Polar Bear | Post-Closure | Water quality following closure may affect wildlife health | Implement Closure and Reclamation Plan<br><br>Sewage treatment plant will remain active during active closure.<br><br>Landfill will be located in a waste rock storage area covered with non- ARD and non-metal leaching waste rock material. PAG and high metal leaching potential waste rock will be stored in designated areas and will be encapsulated with non-PAG and low metal leaching potential waste rock.<br><br>Hydraulic connections to the natural receiving environment will not be re-established until water quality monitoring demonstrates that the water meets water quality guidelines for direct release without further treatment. | No Linkage | No Linkage | This pathway has been previously assessed. For the 2014 FEIS, there were no contaminants of potential concern (COPC) identified in soil, sediment or surface water for further evaluation in the environmental risk assessment. As such, the environmental risk assessment did not proceed beyond the chemical screening stage of the problem formulation for wildlife. This indicates that adverse health effects to wildlife as a result of the 2014 FEIS are not expected. The Meliadine Extension is not expected to change presence of COPC relative to the 2014 FEIS. |
| 61 | Polar Bear | Post-Closure | Permanent changes in wildlife habitat following closure of the mine site | Implement Closure and Reclamation Plan<br><br>Hydraulic connections to the natural receiving environment will be re-established once water quality monitoring demonstrates that the water meets water quality guidelines for direct release without further treatment.<br><br>Site infrastructure will be decommissioned and removed from site. All roads will be decommissioned and scarified. | Minor | Minor | This pathway has been previously assessed. The 2014 FEIS was predicted to cause a minor change in the amount and configuration of habitat for polar bears relative to baseline conditions. The estimated decrease in habitat for some individuals is expected to have a negligible residual effect on the abundance and distribution of the Western Hudson Bay polar bear population, and continued opportunity for traditional and non-traditional use of wildlife. The Meliadine Extension is not expected to cause significant decrease in the amount of polar bear habitat available relative to baseline conditions. |
| 62 | Caribou, Wolf | General construction and operation of mine and supporting infrastructure | Improved access for harvesting can affect wildlife population sizes | Enforce “no hunting, trapping, harvesting or fishing policy” for employees and contractors.<br><br>Access to the mine site will be controlled (gated); public vehicles (cars, trucks) allowed only with special authorization.<br><br>Wildlife will be provided the right-of-way. Vehicle access will be limited when large numbers of caribou are crossing the road; this will occur in consultation with the local HTO.<br><br>All roads will be decommissioned and scarified during closure | Primary | Minor | This pathway has been previously assessed. For the 2014 FEIS, the incremental effect of the AWAR on caribou and wolf survival rates was expected to be detectable but within or slightly exceed the range of baseline values. The Meliadine Extension does not include development of roads that would increase access to wildlife populations relative to the 2014 FEIS (i.e., the AWAR), only access roads adjacent to existing infrastructure. Therefore this pathway was considered to be a minor pathway for the Meliadine Extension. |

**Table B-4: Groundwater Quantity / Hydrogeology - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 1 | Groundwater quantity | Lake Dewatering | Groundwater flow from un-dewatered lakes may be increased because of higher gradients towards dewatered lakes. May lower water levels in un-dewatered lakes | With the exception of Lake B7, A6, A8 and B5, all lakes that will be dewatered do not have open taliks connected to the deep groundwater regime. Furthermore B7 is a headwater lake. Therefore, groundwater flow from lakes that will not be dewatered to those that will does not currently occur and will not occur once the lakes are dewatered. At closure the water levels in the dewatered lakes will be restored to near pre-mining levels.<br><br>Lake B7, which is headwater lake and is predicted to have an open talik, will be dewatered to allow for saline water storage. Once operational, the water level in the reclaim pond will be near to or above pre-mining levels. | No Linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS. In the 2014 FEIS, Lake B7 was to be converted into the TSF. Prior to approval of the first Type A Water Licence (2AM-MEL1631) a decision was made to change from slurry tailings to drystack tailings (Agnico Eagle 2015). For the Meliadine Extension, the drystack TSF will be increased and Lake B7 will be dewatered to allow for saline water storage; the water levels will be near to or above pre-mining levels.<br>Therefore, this pathway is considered as assessed: the hydraulic gradient and the groundwater flow from nearby un-dewatered lakes with open taliks will not be increased due to higher flows being directed to the Lake B7 basin. Consequently, the water levels in nearby un-dewatered lakes are not expected to change as a result of this pathway.<br>There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 2 | Groundwater quantity | Lake Dewatering | Groundwater flow from dewatered lakes may be reduced thereby reducing the flow to nearby un-dewatered lakes, thereby lowering water levels in those nearby lakes | With the exception of Lake B7, A6, A8 and B5, all lakes that will be dewatered do not have open taliks connected to the deep groundwater regime. Therefore, groundwater flow from these lakes to other nearby lakes does not currently occur.<br><br>Lake B7, which is a headwater lake and is predicted to have an open talik, will be dewatered to allow for saline water storage, which may reduce groundwater flow to Lake D7 and Meliadine Lake, thereby lowering water levels in these lakes. Once operational, the water level in the reclaim pond will be near to or above pre-mining levels. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. In the 2014 FEIS, Lake B7 was to be converted into the TSF. Prior to approval of the first Type A Water Licence (2AM-MEL1631) a decision was made to change from slurry tailings to dry stack tailings (Agnico Eagle 2015). For the Meliadine Extension, Lake B7 will be dewatered to allow for saline water storage; the water levels will be near to or above pre-mining levels.<br>Therefore, this pathway is considered as assessed: the changes to the water levels in Lake D7 and Meliadine Lake due to the temporary lowering of Lake B7 during its dewatering are expected to be negligible and this pathway is determined to be minor and no further analysis is required.<br>There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 3 | Groundwater quantity | Lake Dewatering | Lowering of Lake B7 for construction of the TSF may result in artesian conditions that will need to be controlled | Lake B7 currently has a water level that is the highest of lakes with open taliks in the LSA.<br><br>Lake B7 will be dewatered to allow for saline water storage; however, it will still have the highest water level of lakes with open taliks in the LSA. Once operational, the water level in the reclaim pond will be near to or above pre-mining levels. Therefore no artesian pressures will be created. | No Linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS. In the 2014 FEIS, Lake B7 was to be converted into the TSF. Prior to approval of the first Type A Water Licence (2AM-MEL1631) a decision was made to change from slurry tailings to dry stack tailings (Agnico Eagle 2015). For the Meliadine Extension, the dry stack TSF will be increased and Lake B7 will be dewatered to allow for saline water storage; the water levels will be near to or above pre-mining levels. Therefore, this pathway is considered as assessed: current and future conditions will not result in artesian pressures in B7. There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 4 | Groundwater quantity | Open Pits | The development of the open pits may result in higher hydraulic gradients and groundwater flows away neighbouring lakes; thereby lowering their lake levels. | All of the open pits are developed in permafrost; therefore, deep groundwater is unaffected by open pit excavation. | No Linkage | No Linkage | No changes are proposed to the development of the open pits for the Meliadine Extension. Therefore, this pathway has been previously assessed. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 5 | Groundwater quantity | Open Pits | Large open pits will alter thermal regime and may produce open taliks were none existed before that may alter the regional groundwater flow directions. | Flooded open pits that have produced open taliks where none existed before will develop static water levels that will reproduce the current regional groundwater flow conditions. | Minor | Minor | No changes are proposed for the Meliadine Extension, therefore this pathway has been previously assessed. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |

**Table B-4: Groundwater Quantity / Hydrogeology - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 6 | Groundwater quality and quantity | Underground | High TDS mine inflow will be induced to flow up into underground mine and may alter groundwater quality and quantity | During mining, groundwater flowing into the underground mine will be collected, treated, and discharged to Itivia Harbour.<br><br>At closure, pumping of high TDS water to the surface will stop; the underground will be allowed to fill with groundwater inflows and any remaining high TDS water on surface will be pumped to the open pit and/or underground. | Minor | Minor | No changes are proposed for the Meliadine Extension, therefore this pathway has been previously assessed. Mitigation measures outlined in the 2014 FEIS, and the 2018 and 2020 Addenda will be carried forward through the Meliadine Extension. |
| 7 | Groundwater quality and quantity | Underground | Removal of bedrock and ore material may change or alter existing faults and change contaminant transport processes in subsurface and surface water quality | Groundwater investigations found that faults intersecting the underground mine have hydraulic conductivities similar to the adjacent un-faulted rock. | No Linkage | No Linkage | No changes are proposed for the Meliadine Extension, therefore, this pathway has been previously assessed as groundwater investigations still find that faults intersecting the underground mine have hydraulic conductivities similar to the adjacent un-faulted rock. Presently, the characterization of faults is enhanced for the Meliadine Extension as the current underground developments intercept several faults. |
| 8 | Groundwater quantity | Underground | When mining the underground below the permafrost, deep groundwater will be induced to flow to the underground mine. This groundwater flow may originate from nearby lakes that have an open talik and may result in a lowering of water levels in the lake. | Lakes B4, B5, B7, A6, A8, CH6, D4 and Meliadine Lake have open taliks connected to the deep groundwater regime. The inflow of saline groundwater will be mitigated through active grouting as the development advances as well as sequential lake dewatering.<br><br>At closure, the groundwater flow directions and quantities will be restored. | Minor | Minor | No changes are proposed for the Meliadine Extension, therefore this pathway has been previously assessed. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. Groundwater inflows are presently intercepted at the Tiriganiaq Underground, where mining has extended into the cryopeg and sub-permafrost groundwater flow system. Groundwater inflows are mitigated by active grouting which locally reduces the effective hydraulic conductivity of structures adjacent to the development. |
| 9 | Groundwater quantity | Underground | When mining the underground below the permafrost, deep groundwater will be induced to flow to the underground mine. This groundwater inflow may reduce the inflow to a nearby lake that has an open talik and this may result in a lowering of water levels in the lake. | Lakes B4, B5, B7, A6, A8, CH6, D4 and Meliadine Lake have open taliks connected to the deep groundwater regime.<br><br>Lake B7 is a headwater lake and deep groundwater does not currently report to this lake.<br><br>At closure the groundwater flow directions and quantities will be restored. | Minor | Minor | This pathway has been previously assessed. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. Groundwater inflows are presently intercepted at the Tiriganiaq Underground, where mining has extended into the cryopeg and sub-permafrost groundwater flow system. Groundwater inflows are mitigated by active grouting which locally reduces the effective hydraulic conductivity of structures adjacent to the development. |
| 10 | Groundwater quality | Underground | When mining the underground below the permafrost, progressive backfilling of mine stopes with cemented tailings and/or cemented crushed rock will occur and groundwater quality may be affected. | During operations when mining is occurring in the underground below the permafrost, groundwater flowing through the backfill and into the mine will be collected, monitored and treated, if required.<br><br>Once the cemented backfill is cured, metals will no longer leach from the backfill. | No Linkage | No Linkage | No changes are proposed for the Meliadine Extension, therefore this pathway has been previously assessed. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 11 | Groundwater quality | Underground | High TDS water will flow into underground mine at closure which may result in a flooded volume with high salinity | At closure, pumping of high TDS water to the surface will stop; the underground will be allowed to fill with groundwater inflows and any remaining high TDS water on surface will be pumped to the open pit and/or underground. | No Linkage | No Linkage | No changes are proposed for the Meliadine Extension, therefore this pathway has been previously assessed. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |

**Table B-4: Groundwater Quantity / Hydrogeology - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 12 | Groundwater quality | Waste rock storage facility | Seepage from waste rock storage facilities could result in changes to groundwater quality. | Waste rock storage facilities are located above permafrost or lakes with closed taliks (unfrozen ground does not extend to groundwater regime beneath permafrost). During operations seepage will be collected and treated.<br><br>Geochemical testing indicates that waste rock and overburden is non-potentially acid generating and non-metal leaching. Kinetic tests completed on all waste rock types and at various scales show that drainage water quality is expected to meet Metal and Diamond Mining Effluent Regulations (MDMER) monthly mean effluent limits. | No Linkage | No Linkage | No changes are proposed for the Meliadine Extension, therefore this pathway has been previously assessed. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 13 | Groundwater quality | Underground water storage | Underground water from the Tiriganiaq mine is stored in the dewatered Lake B7 may effect the talik or permafrost beneath the basin either during its use for storage of underground water | Saline water will be pumped from the underground and temporarily stored in the dewatered Lake B7 basin in 2025.<br>Lake B7 is underlain by a closed talik. The temporary storage of saline water will not likely result in the development of an open talik beneath the basin. | Minor | Minor | Underground water will be stored in Lake B7, which is underlain by an open talik. Lake B4 will not be used as a waste rock storage facility (WRSF) and will be used as contact water pond. The storage of saline and contact water will not have an effect on the talik conditions nor permafrost beneath the basins. |
| 14 | Groundwater quality | Mine infrastructure (e.g., open pits, dikes, waste rock storage facilities, mine plant, site roads). All-weather Access Road (AWAR) and haul roads. Rankin Inlet Infrastructure | Sediment releases from infrastructure and road construction, including watercourse crossings, may affect quality of groundwater. | Best management practices will be used to control sediment releases during construction.<br>Where possible, in-stream works will be completed in winter when watercourses are frozen; no in-stream works will be conducted between 1 May to 15 July to avoid critical periods for fish.<br>Construction runoff will be captured and discharged into a collection pond to settle out suspended sediments.<br>Roads will be designed as narrow as possible, while maintaining safe construction and operation practices, and meeting legislated requirements. For example, minimum haul road widths are defined under the Mine Health and Safety Act.<br>Roads constructed on permafrost, which provides a barrier to downward flow of poor quality water to the deep groundwater regime. | No Linkage | No Linkage | No changes are proposed for the Meliadine Extension, therefore this pathway has been previously assessed. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 15 | Groundwater Quality | General construction of mine and supporting infrastructure | Potential impacts on groundwater quality in relation to site waste management activities other than waste rock and tailings, including: handling and landfilling of waste; handling of contaminated ice, snow and/or soil; the management of historical contaminated material (e.g., previous spills, mishaps, releases, etc.), and sewage effluent discharges. | Adhere to the Landfill and Waste Management Plan.<br>The sewage treatment plant for the camp facilities is designed to meet the Nunavut effluent guidelines for wastewater and is discharged to Meliadine Lake and no longer in the TSF.<br>Hazardous materials and fuel is stored according to regulatory requirements to protect the environment and workers (i.e., Hazardous Materials Management Plan).<br>As necessary, individuals working on-site and handling hazardous materials will be trained, notably in the Transportation of Dangerous Goods and Hazmat.<br>Use landfarm to treat soils and rock contaminated by light hydrocarbons.<br>Infrastructure will be constructed on permafrost, which provides a barrier to downward flow of poor quality water to the deep groundwater regime. | No Linkage | No Linkage | No changes are proposed for the Meliadine Extension, therefore this pathway has been previously assessed. In the 2014 FEIS, the TSF was designed as a slurry tailings and the wastewater was planned to be deposited within the TSF. Prior to approval of the first Type A Water Licence (2AM-MEL1631) a decision was made to change from slurry tailings to dry stack tailings (Agnico Eagle 2015). For the Meliadine Extension, the dry stack TSF will be increased and no wastewater will be placed in the TSF. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |

**Table B-4: Groundwater Quantity / Hydrogeology - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 16 | Groundwater quality | General construction of mine and supporting infrastructure | Spills and leaks during equipment operation may affect groundwater quality | Equipment is re-fueled, serviced, and washed away from stream crossings and on impermeable pads wherever possible. There is a wash bay in the maintenance shop.<br>Adhere to the Spill Contingency Plan.<br>Ready access to an emergency spill clean-up kit for cleaning-up any spills.<br>Hazardous materials and fuel will be stored according to regulatory requirements to protect the environment and workers (i.e., Hazardous Materials Management Plan). As necessary, individuals working on-site and handling hazardous materials will be trained, notably in the Transportation of Dangerous Goods and Hazmat.<br>Use landfarm to treat soils and rock contaminated by light hydrocarbons.<br>Construction and mining equipment, machinery, and vehicles will be regularly maintained.<br>Fuel storage tanks will be situated in a secondary containment area capable of containing 110% of the contents of the largest tank. The storage tanks and fuel-dispensing systems will be constructed in accordance with current regulatory requirements and National Fire Code. Fuel reconciliation will be conducted and structural integrity will be routinely inspected.<br>Permafrost will provide a barrier for downward flow of poor quality water to the deep groundwater regime. | No Linkage | No Linkage | No changes are proposed for the Meliadine Extension, therefore this pathway has been previously assessed. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |

**Table B-5: Hydrology - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 1 | Hydrology | General Construction and Operation of Mine and Supporting Infrastructure | Process and potable water use may result in reduced water levels in Meliadine Lake | Water withdrawal rate will be controlled to avoid adverse effects on the water source waterbody.<br>Fresh water sourced from Meliadine Lake for operation purposes will be minimized by recycling process water at the filter press. | Minor | Minor | This pathway has been previously assessed. The annual volume of water used will be the same as in the 2014 FEIS and thus there is no change from the previous assessment. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 2 | Hydrology | Site Water Management: Dewatering of Project Footprint Waterbodies to Downstream Receiving Waterbodies (e.g., to Lake A7, A1, B6, B34, Meliadine Lake) | Dewatering of waterbodies may result in ice damming and alter flow path | Pumped discharge will cease during the winter. | Minor | No Linkage | This pathway has been previously assessed. No change from the 2014 FEIS. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 3 | Hydrology | Pit development and closure | Removal of bedrock and ore material during the active mining of pits may change shallow groundwater quantity in local watersheds, and the water level in small waterbodies in local watersheds | Mining of the open pit will promote formation of localized permafrost during operation.<br>Mined-out pit flooding will be augmented by active fresh water diversion.<br>Active flooding will reduce the period required to flood the pits, and the period of time with increased hydraulic gradients between waterbodies. | Minor | Minor | This pathway has been previously assessed. The annual volume of water used will be the same as in the 2014 FEIS and thus there is no change from the previous assessment. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 4 | Hydrology | Construction and operation of mine site roads, AWAR, road to Discovery, and Rankin Inlet bypass Road | Cross-drainage structures for the mine site roads, AWAR, road to Discovery, and Rankin Inlet bypass Road may alter stream hydraulics and geomorphology | Cross-drainage structures will be designed and constructed such that structures will convey peak flows. | Minor | No Linkage | This pathway has been previously assessed. No change from the 2014 FEIS. The AWAR and Bypass road have already been built and are open to the public. The Haul Road from the AWAR to Discovery, has been approved through the Water Licence Amendment. The mitigations measures outlined in the 2014 FEIS will be carried forward for the site roads required for the Meliadine Extension. |
| 5 | Hydrology | Construction and operation of mine site roads, AWAR, road to Discovery, and Rankin Inlet bypass Road | Freezing and plugging of culverts in the winter may result in the following:<br>1. over-topping and erosion of road surface releasing silt onto terrain and soils;<br>2. ponding of water adjacent to road flanks;<br>3. potential instability and thaw settlement of road shoulders;<br>4. thaw settlement beneath and adjacent to culverts; and<br>5. ice lens growth. | Use of staggered culvert configuration, and removal of snow at the culvert inlet and outlet prior to the freshet to promote drainage during spring thaw and freshet.<br>Regular inspection of the road to identify any areas where ponding of water along the road represents a risk, and installing additional culverts to alleviate the risk. | Minor | No Linkage | This pathway has been previously assessed. No change from the 2014 FEIS. The AWAR and Bypass road have already been built and are open to the public. The Haul Road from the AWAR to Discovery, has been approved through the Water Licence Amendment. The mitigations measures outlined in the 2014 FEIS will be carried forward for the site roads required for the Meliadine Extension. |
| 6 | Hydrology | Construction and operation of mine site roads, AWAR, road to Discovery, and Rankin Inlet bypass Road | Widening of the AWAR may alter stream hydraulics and geomorphology | The full base width of the AWAR road was constructed during initial construction of the AWAR. The running surface of the AWAR will be widened without widening the base width. | Minor | No Linkage | This pathway has been previously assessed. No change from the 2014 FEIS. The AWAR and Bypass road have already been built and are open to the public. The Haul Road from the AWAR to Discovery, has been approved through the Water Licence Amendment. |
| 7 | Hydrology | Construction and operation of mine site roads, AWAR, road to Discovery, and Rankin Inlet bypass Road | Cross-drainage structures for the mine site roads, AWAR, road to Discovery, and Rankin Inlet bypass road will prevent navigability | Cross-drainage structures will be designed to allow navigation (i.e., bridge) for crossings with navigable waters.<br>Regular inspections will be completed | No Linkage | No Linkage | This pathway has been previously assessed. No change from the 2014 FEIS. The AWAR and Bypass road have already been built and are open to the public. The Haul Road from the AWAR to Discovery, has been approved through the Water Licence Amendment. The mitigations measures outlined in the 2014 FEIS will be carried forward for the site roads required for the Meliadine Extension. |

**Table B-6: Water Quality - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Rationale |
|---|---|---|---|---|---|---|---|
| 1 | Water Quality | Road footprint during construction, Operations, and Closure | Project footprint, which will physically alter drainage patterns, may change downstream flows, water levels, and channel/bank stability in streams, and affect water and sediment quality. | Access roads will be as narrow as possible, while maintaining safe construction and operation practices. Minimum haul road widths will follow that defined under the Mine Health and Safety Act.<br>Adhere to the Sediment and Erosion Management Plan.<br>Minimum setback distance of 31 m from the ordinary high water mark of waterbodies.<br>Regular road inspections to check for ponding.<br>Removal of snow at the culvert inlet prior to freshet, as outlined in the Freshet Management Plan.<br>Where practical, natural drainage patterns will be used to reduce the use of ditches and diversion berms.<br>A site water management plan has been developed and describes designs to reduce changes to local flows, drainage patterns, and drainage areas. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 2 | Water Quality | Mine and Supporting Infrastructure during construction, operations, and closure. | Sediment releases from infrastructure and road construction, including watercourse crossings, can affect quality of nearby surface waters and sediments. | Adhere to the Sediment and Erosion Management Plan.<br>Instream construction work will be avoided, or limited to the minimum extent possible.<br>In-stream works will be completed in winter, when possible, to avoid increased TSS and turbidity, and changes to water and sediment quality.<br>Where applicable, construction runoff will be captured and managed to minimize suspended solids.<br>Proposed roads will be as narrow as possible, while maintaining safe construction and operating practices. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 3 | Water Quality | Construction and operation of camps | The construction and operation of camps may cause erosion and release of substances to surface water and could affect water and sediment quality | Best management practices for erosion and sedimentation control; and storage and use of chemicals will be implemented (adhere to the Sediment and Erosion Management Plan).<br>Ditches will be constructed to route any runoff water to a collection pond.<br>The sewage treatment plant for the camp facilities is designed to meet the Nunavut effluent guidelines for wastewater and is discharged to Meliadine Lake, no longer in the tailings storage facility. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 4 | Water Quality | Mine and Supporting Infrastructure during construction and operations | Process and potable water use resulting in reduced water levels can affect water quality in Meliadine Lake. | Water withdrawal rate(s) will be controlled to avoid effects on the source water lake(s).<br>Capture and reuse site water to reduce fresh water requirements.<br>Fresh water sourced from Meliadine Lake for operation purposes will be minimized by recycling process water at the filter press. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. The annual volume of water to be used is the same as that assessed and approved in 2014. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 5 | Water Quality | Mine and Supporting Infrastructure during construction and operations | Spills and leaks during equipment operation can affect water and sediment quality of nearby surface waters. | Hazardous materials and fuel will be stored according to regulatory requirements to protect the environment and workers (i.e., Hazardous Materials Management Plan).<br>Storage tanks (e.g., fuel, engine oil, hydraulic oil, and waste oil and coolant) will be double walled, or located in lined and bermed containment areas.<br>Hazardous wastes will be stored on site in appropriate containers to prevent exposure until they are shipped off site to an approved facility.<br>Individuals working on site and handling hazardous materials will be trained in the Transportation of Dangerous Goods.<br>Soils from petroleum spill areas will be deposited and spread in a lined landfarm for remediation.<br>A Spill Response Plan has been developed.<br>Emergency spill kits will be available wherever toxic materials or fuel are stored and transferred. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |

**Table B-6: Water Quality - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Rationale |
|---|---|---|---|---|---|---|---|
| 6 | Water Quality | Site Water Management: Seepage and Runoff during operations and closure | Runoff and leaching from the waste rock storage facilities and mine footprint may change surface water and sediment quality (i.e., metal concentrations). | A Water Management Plan has been developed and describes the containment and management of contact water on-site.<br>Runoff from the Project site will be diverted to sumps and collection ponds (and treated if required) prior to release into Meliadine Lake.<br>Runoff from saline waste rock facilities will be diverted to the saline collection pond prior to discharge to Itivia Harbour via the waterline.<br>Water quality in collection ponds will be monitored and managed such that the discharge entering Meliadine Lake meets discharge limits.<br>Potential acid generating rock and metal leaching waste rock will be segregated at source and placed into designated areas within waste rock locations. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Monitoring is regularly conducted to identify seepage locations; identified seepage is collected<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 7 | Water Quality | Site Water Management: Seepage and Runoff during operations and closure | Contact water from the tailings storage facility may enter nearby waterbodies and change water and sediment quality (i.e., metal concentrations). | A Water Management Plan has been developed and describes the containment and management of contact water on-site.<br>Contact water will be captured in collection ponds.<br>Tailings facility contact water will be monitored for water quality, and treated as required, prior to discharge. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Monitoring is regularly conducted to identify seepage locations; identified seepage is collected<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 8 | Water Quality | Site Water Management: Seepage and Runoff during operations and closure | Seepage of pore water through, or underneath, incompletely frozen dikes to adjacent watersheds may change water and sediment quality in local watersheds. | A Water Management Plan has been developed and describes containment and management of contact water on-site.<br>The dikes will be designed and constructed to control seepage.<br>Performance of the dikes will be monitored and appropriate remediation applied if required. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Monitoring is regularly conducted to identify seepage locations; identified seepage is collected<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 9 | Water Quality | Pit development and operations | Release of pit water inflows to local watersheds may affect water and sediment quality in local watersheds. | Inflows to the pits or other dewatered areas will not be directly released to local watersheds. Inflows will be directed to contact water pond prior to treatment and discharge to Itivia Harbour by the waterline, or Meliadine Lake as per the Adaptive Management Plan. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS, 2018 FEIS Addendum, and the 2020 FEIS Addendum<br>There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS, 2018 FEIS Addendum, and the 2020 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 10 | Water Quality | Pit development and operations | Removal of bedrock and ore material during the active mining of pits may change groundwater quantity in local watersheds, and the water level in small waterbodies in local watersheds | During closure, mined-out pit flooding will be augmented by fresh water diversion. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. The open pits will not intersect the deep groundwater; effects to groundwater baseflows in streams is expected to be negligible. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 11 | Water Quality | Pit development and operations | Removal of bedrock and ore material may change or alter existing faults and change contaminant transport processes in subsurface and surface water quality | Tailings storage facility design has changed from slurry deposition to dry stack and will be built on permafrost which will be maintained during all phases of the project | No Linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS. This pathway is considered to have no linkage to hydrogeology and thus it is expected to have no linkage to surface water. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |

**Table B-6: Water Quality - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Rationale |
|---|---|---|---|---|---|---|---|
| 12 | Water Quality | Pit Development | Removal of saline effluent inflows during pit development to local watersheds may affect water and sediment quality in local watersheds | Water inflow to the dewatered areas will not be directly released to local watersheds; water will be treated and then diverted to a collection pond prior to release into Itivia Harbour via the waterline. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS, 2018 FEIS Addendum, and the 2020 FEIS Addendum<br>The open pits will be developed in permafrost and are not connected to deep groundwater. However, any groundwater flows that report to the pits will be collected, treated, and discharged to Itivia Harbour. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS, 2018 FEIS Addendum, and the 2020 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 13 | Water Quality | Construction and operation of roads | Cross-drainage structures for the mine site roads, AWAR, and Rankin Inlet bypass Road may alter stream hydraulics and geomorphology, and alter water and sediment quality | Cross-drainage structures will be designed and constructed such that structures will not create a hydraulic barrier to fish passage and will convey peak flows.<br>Minimum setback distance of 31 m from the ordinary high water mark of waterbodies.<br>Regular road inspections to check for ponding.<br>Removal of snow at the culvert inlet prior to freshet. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. The AWAR and Bypass road have already been built and are open to the public. The road to Discovery, has been approved through the Water Licence Amendment. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward for the site roads required for the Meliadine Extension. |
| 14 | Water Quality | Construction and operation of roads | Freezing and plugging of culverts in the winter may result in over-topping and erosion of road surface releasing silt into watercourses during freshet and affect water and sediment quality | Use of staggered culvert configuration to promote drainage during spring thaw and freshet.<br>Regular inspection of the road to identify any areas where ponding of water along the road represents a risk, and installing additional culverts to alleviate the risk. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. The AWAR and Bypass road have already been built and are open to the public. The road to Discovery, has been approved through the Water Licence Amendment. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward for the site roads required for the Meliadine Extension. |
| 15 | Water Quality | Construction and operation of roads | Release of potential acid generating materials from road building materials at the watercourse crossings can alter water and sediment quality | Use of non-acid generating material at all watercourse crossings. Testing will continue on new sources identified for road building.<br>Rock quarry activity will be at least 31 m from the high water mark of any waterbody. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. The AWAR and Bypass road have already been built and are open to the public. The road to Discovery, has been approved through the Water Licence Amendment. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward for the site roads required for the Meliadine Extension. |
| 16 | Water Quality | Construction and operation of roads | Surface water drainage through quarries and transport of blasting residuals and metals directly into watercourses can affect surface water and sediment quality | Where possible, stockpiling of rock and fill from quarries and borrow sites will be placed such that surface water is not diverted through the piles with runoff to surface waterbodies; drainage from quarries will not flow directly into any waterbodies or watercourses.<br>When there is seepage from a quarry that could enter a waterbody, a water quality sample will be collected and analyzed.<br>Quarries will be excavated and sloped for positive drainage.<br>Quarries will be inspected on a regular basis to monitor water ponding, particularly at spring melt.<br>Excavations will be at least 31 m away from any watercourses.<br>Best management practices for erosion and sediment control, per the Sediment and Erosion Management Plan. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward for the Meliadine Extension. |

**Table B-6: Water Quality - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Rationale |
|---|---|---|---|---|---|---|---|
| 17 | Water Quality | Ongoing Exploration | Ongoing exploration, and uptake and release of water, can affect surface water and sediment quality | Adhere to the Sediment and Erosion Management Plan.<br>Best management practices for storage and treatment, if necessary, of any release water.<br>Testing, as required by operational licence, before release of water.<br>Best management practices for withdrawal rates, withdrawal volumes, and timing of withdrawals.<br>Reuse of water, where applicable, to reduce water usage. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward for the Meliadine Extension. |
| 18 | Water Quality | Decommissioning (e.g., roads, buildings, infrastructure, underground workings) during closure | Removal of project infrastructure (e.g., roads, dikes, etc.) may change flows and cause of release sediment and contaminants and can affect water and sediment quality. | A Conceptual Closure and Reclamation Plan has been developed and describes measures for permanent closure.<br>Best management practices for erosion and sedimentation control such as installation of rip-rap, if applicable, to prevent erosion after removal of the culverts.<br>Instream work will be limited to the minimum extent possible.<br>Instream work will follow DFO operational guidance and timing windows.<br>All bridges and culverts will be removed and original drainage patterns restored. Stream crossings will be rehabilitated.<br>Dikes will be breached to a minimum depth of 1 m below average lake water level or back to original and berms will be removed, these activities will be timed to minimize release of sediments.<br>In the underground workings, seal all drill holes and openings connected to the surface.<br>Remove unused explosives and other chemicals from the mine site.<br>Roads will be scarified, allowing native plants to re-establish, and slopes will be stabilized against erosion. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Monitoring during decommissioning will be conducted following the approved closure plan. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 19 | Water Quality | Decommissioning of tailings and waste rock storage facilities during closure | Activities required for covering and reclaiming the tailings and waste rock storage facilities may cause release of contaminants and can affect water and sediment quality. | A Conceptual Closure and Reclamation Plan has been developed and describes measures for permanent closure.<br>The waste rock storage facilities and tailings storage facility have been designed for long-term stability.<br>The top surface of the tailings and waste rock storage facilities will be graded to shed water from the surface. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Monitoring during decommissioning will be conducted following the approved closure plan. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 20 | Water Quality | Remediation of collection pond CP1 during closure | Reconnection of collection ponds to Meliadine Lake can affect water and sediment quality. | A Conceptual Closure and Reclamation Plan has been developed and describes measures for permanent closure.<br>Sediments will be analyzed, and if concentrations are higher than baseline or guidelines, sediments will be managed according to best practices. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Monitoring during decommissioning will be conducted following the approved closure plan. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |

**Table B-7: Fish and Fish Habitat - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Rationale |
|---|---|---|---|---|---|---|---|
| 1 | Fish and Fish Habitat | General construction and operations of mine infrastructure including All-Weather Access Road (AWAR), road to Discovery, and bypass road | Mine footprint will affect the connectivity of fish habitat within the Meliadine Lake Peninsula (e.g., Lake A6 in upper A basin), affecting abundance and distribution of fish. | Compact layout of the surface facilities within local watersheds will limit the area that is disturbed by construction and operation. Diversion channels will be designed to provide fish habitat and conditions allowing for passage of Arctic char, Lake Trout, and Arctic Grayling.<br>Habitat fragmentation will occur during construction and operation, as hydrological conditions within affected basins of the LSA will be re-connected either during later stages of operation, or at closure, as described in the Water Management Plan. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. The AWAR and Bypass road have already been built and are open to the public. The road to Discovery, has been approved through the Water Licence Amendment. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 2 | Fish and Fish Habitat | General construction and operation of mine infrastructure including All-Weather Access Road (AWAR), road to Discovery, and bypass road | Crossing structures may alter stream hydraulics and geomorphology, potentially blocking or delaying fish movements in streams (e.g., roads). | Cross-drainage structures will be designed and constructed such that structures will not create a hydraulic barrier to fish passage and will convey peak flows.<br>Single span bridges at the Char and Meliadine rivers and at the M5.0 crossing are used to minimize blockages to fish movement.<br>Use of staggered culvert configuration, and removal of snow at the culvert inlet and outlet prior to the freshet to promote drainage during spring thaw and freshet.<br>Regular inspection of the road to identify any areas where ponding of water along the road represents a risk, and installing additional culverts to alleviate the risk. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. The AWAR and Bypass road have already been built and are open to the public. The road to Discovery, has been approved through the Water Licence Amendment. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 3 | Fish and Fish Habitat | General construction and operation of mine infrastructure including All-Weather Access Road (AWAR), road to Discovery, and bypass road | Changes in flow paths, and diversion of non-contact water to newly modified watersheds, may affect turbidity and TSS concentrations at downstream locations, affecting fish habitat quality. | Construction runoff will be captured and discharged into a collection pond to settle out suspended sediments.<br>Compact layout of the surface facilities within local watersheds will limit the area that is disturbed by construction and operation.<br>Adhere to Water Management Plan, and the Sediment and Erosion Management Plan.<br>Best management practices will be used to control sediment releases during construction activities resulting in land disturbance (e.g., silt curtains).<br>Shoreline areas susceptible to extensive erosion will be addressed by appropriate erosion protection measures to reduce erosion and associated resuspension of fine sediment. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 4 | Fish and Fish Habitat | General construction and operation of mine infrastructure including All-Weather Access Road (AWAR), road to Discovery, and bypass road | Sediment releases from land disturbance during construction and road construction, including watercourse crossings, can affect quality of nearby surface waters and fish habitat quality. | Best management practices will be used to control sediment releases during construction (e.g., silt curtains, runoff management).<br>Construction runoff will be captured and discharged into a collection pond to settle out suspended sediments.<br>Instream construction work will be avoided, or limited to the minimum extent possible.<br>Where possible, in-stream works will be completed in winter when watercourses are frozen; no in-stream works conducted between 1 May to 15 July to avoid critical periods for fish.<br>Roads will be designed as narrow as possible, while maintaining safe construction and operation practices, and meeting legislated requirements. For example, minimum haul road widths are defined under the Mine Health and Safety Act, SNWT (Nu).<br>Bridge abutment installation will occur outside of the high-water mark, and construction will occur in winter.<br>Disturbed areas along the streambanks will be stabilized and allowed to revegetated upon completion of work. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 5 | Fish and Fish Habitat | General construction and operation of mine infrastructure including All-Weather Access Road (AWAR) | Process potable water use resulting in reduced water levels can affect water quality and fish habitat quality in Meliadine Lake. | Adhere to the Water Management Plan.<br>Contact water will be monitored and managed through Collection Ponds.<br>Surface runoff and groundwater seeping into the open pits will be collected in in-pit sumps.<br>Underground water will be re-cycled for re-use underground, where possible. Excess underground water with high salinity will be treated.<br>Discharge quality will meet MDMER at end of pipe and will meet CCME aquatic life standards within a 100 m wide mixing zone of the diffuser in Meliadine Lake.<br>Water withdrawal rate(s) will be controlled to avoid effects on the source water lake(s).<br>Capture and reuse site water to reduce fresh water requirements. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. The annual volume of water to be used is the same as that assessed and approved in 2014. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |

**Table B-7: Fish and Fish Habitat - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Rationale |
|---|---|---|---|---|---|---|---|
| 6 | Fish and Fish Habitat | General construction and operation of mine infrastructure including All-Weather Access Road (AWAR), road to Discovery, and bypass road | Spills and leaks can affect water and sediment quality of nearby surface waters, affecting fish habitat quality and abundance and distributions. | Equipment will be re-fueled, serviced, and washed away from stream crossings.<br>Adhere to the Spill Contingency Plan. Ready access to an emergency spill clean-up kit for cleaning up any spills.<br>Vehicles properly loaded and loads appropriately covered where necessary.<br>Hazardous materials and fuel will be stored according to regulatory requirements to protect the environment and workers (i.e., Hazardous Materials Management Plan). Individuals working on site and handling hazardous materials will be trained in the transportation of Dangerous Goods and Hazmat Response.<br>Use landfarm to treat soils and rock contaminated by light hydrocarbons.<br>Fuel storage tanks will be situated in a lined and bermed containment area capable of containing 110 per cent of the contents of the largest tank. The storage tanks and fuel-dispensing systems will be constructed in accordance with current regulatory requirements and fire regulations.<br>Fuel will be transported year-round by double walled tanker trucks to the Meliadine tank farm.<br>Construction and mining equipment, machinery, and vehicles will be regularly maintained. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 7 | Fish and Fish Habitat | Site Water Management: Seepage and Runoff during Construction and Operations. | Runoff and leaching from the waste rock in waste rock storage facilities and mine footprint may change surface water and sediment quality (i.e., metal concentrations), and affect fish health and fish habitat quality. | Contact water will be managed on-site in accordance with the Water Management Plan.<br>Runoff and seepage from waste rock storage facilities will be collected in sumps located in low topographic points around the perimeter. This water will be monitored for water quality and if necessary transferred to collection ponds before discharge.<br>Surface runoff and groundwater seeping into the open pits will be collected in in-pit sumps.<br>Sumps will be sized to hold water running off the waste rock storage facilities and the ore stockpiles and open pits.<br>Construction materials will be clean and contaminant free.<br>Landfill will not contain any putrescible organic matter so seepage is not expected. Design waste rock management procedures for potentially problematic waste rock material.<br>Use of non-acid generating and non-metal leaching material at all watercourses. Any PAG or high metal leaching waste rock will be segregated at source and placed into designated areas within the waste rock storage facilities.<br>PAG and high metal leaching waste rock will be encapsulated with non -PAG and low metal leaching rock.<br>Over time potential PAG and high metal leaching rock will become permanently frozen with an active cover layer of non-PAG rock. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Monitoring is regularly conducted to identify seepage locations; identified seepage is collected. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 8 | Fish and Fish Habitat | Site Water Management: Seepage and Runoff during Construction and Operations. | Vertical and lateral seepage from the tailings storage facility may enter nearby waterbodies, affecting water and sediment quality (i.e., metal concentrations), as well as fish health and fish habitat quality. | Contact water will be managed on-site in accordance with the Water Management Plan.<br>Excess tailings supernatant water will be treated for parameters of potential concern prior to release to a collection pond and Meliadine Lake.<br>Seepage from the TSF containment dikes will be captured at sumps and diverted back to the TSF.<br>At closure, the tailings storage facility will be dewatered and covered with waste rock; runoff will be collected and then treated until it is confirmed that water meets water quality criteria. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Monitoring is regularly conducted to identify seepage locations; identified seepage is collected. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 9 | Fish and Fish Habitat | Site Water Management during Construction and Operations: Seepage and Runoff. | Seepage of pore water though, or underneath, incompletely frozen dikes to adjacent watersheds may change water quality in local watersheds, and affect fish health and fish habitat quality. | Contact water will be managed on-site in accordance with the Water Management Plan.<br>Internal retention dikes will be constructed with a wide till core to control seepage.<br>Permafrost will be preserved in foundation beneath dikes by constructing structures during the winter when the active layer is frozen where possible.<br>Performance of the dikes will be monitored throughout their construction and operating life. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Monitoring is regularly conducted to identify seepage locations; identified seepage is collected. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |

**Table B-7: Fish and Fish Habitat - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Rationale |
|---|---|---|---|---|---|---|---|
| 10 | Fish and Fish Habitat | Site Water Management during Construction and Operations: Alteration of Flow Paths and Diversion of Project Footprint. | The active diversion of water from lakes to other locations either within or to adjacent sub-basins will increase flows to receiving downstream waterbodies and watercourses, potentially increasing available fish habitat. | Adhere to the Water Management Plan.<br>Pumped discharge will be directed to the lake environment, and not directly to outlets, to attenuate flow changes.<br>Final discharge locations will be determined during the detailed design stage and may be modified based on monitoring results. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. Pumped discharges for dewatering will be directed to a lake environment (not directly to outlets) or to a treatment facility and for discharge through the permanent diffusers. The sub-watersheds to be affected by the Extension are the same as those in the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 11 | Fish and Fish Habitat | Site Water Management during Construction and Operations: Alteration of Flow Paths and Diversion of Project Footprint. | Active diversion of water from footprint lakes to receiving locations may affect channel/bank stability, and water quality (e.g., suspended sediments, nutrients, metals) in receiving and downstream waterbodies, and therefore, affect water quality, fish habitat quality and the abundance and distribution of fish. | Dewatering activities will be monitored so that corrective actions can be taken to minimize sedimentation, for example, maintain lake surface at a level that limits sediments in dewatered lakes becoming suspended due to wave action.<br>Pumped discharge will be directed to the lake environment, and not directly to outlets, to attenuate flow changes.<br>Shoreline areas susceptible to extensive erosion will be addressed by appropriate erosion protection measures to reduce erosion and associated re-suspension of fine sediment.<br>Where practical, natural drainage patterns will be used to reduce the use of ditches or diversion berms.<br>Lake dewatering discharge will be sampled regularly to monitor for compliance with discharge criteria, and any water not meeting the criteria will be treated or stored within the controlled Collection Ponds until it meets criteria.<br>Pumped water from the dewatered lakes will be directed through properly designed structures to prevent erosion in the receiving waterbodies. | Minor | No Linkage | This pathway has been previously assessed through the 2014 FEIS. Water diverted around the mine footprint will be directed to waterbodies to manage changes in flows. The sub-watersheds to be affected by the Extension are the same as those in the 2014 FEIS. This pathway is considered to have no linkage to fish and fish habitat. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 12 | Fish and Fish Habitat | Site Water to Receiving Waterbodies during Construction and Operations. | Alteration of watershed flow paths under the Project footprint may affect channel/bank stability and water quality (e.g., suspended sediments) in downstream waterbodies, and affect aquatic health, fish habitat quality and the abundance and distribution of fish. | Shoreline areas susceptible to extensive erosion will be addressed by appropriate erosion protection measures to reduce erosion and associated resuspension of fine sediment.<br>Where practical, natural drainage patterns will be used to reduce the use of ditches or diversion berms. Water quality will be monitored regularly for turbidity, and intermittently for TSS, nutrients and metals. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. The sub-watersheds to be affected by the Extension are the same as those in the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 13 | Fish and Fish Habitat | Site Water to Receiving Waterbodies during Construction and Operations. | The Waste Rock and tailings storage facility will physically alter the size and shape of watersheds, and alter existing flow paths within the LSA, which may decrease downstream flows, and water levels, affecting available fish habitat, and the abundance and distribution of fish. | Compact layout of the surface facilities within local watersheds will limit the area that is disturbed by construction and operation.<br>Use of design features to reduce changes to local flows, drainage patterns, and drainage areas.<br>Refer to the Conceptual Fish Offsetting Plan for mitigation measures. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. The sub-watersheds to be affected by the Extension are the same as those in the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 14 | Fish and Fish Habitat | Site Water to Receiving Waterbodies during Operations. | The active diversion of water from waterbodies to other locations either within or to adjacent subbasins during operation phases will increase flows to receiving downstream waterbodies and watercourses, potentially increasing habitat quantity. | Adhere to the Water Management Plan.<br>Pumped discharge will be directed to the lake environment, and not directly to outlets, to attenuate flow changes.<br>Shoreline areas susceptible to extensive erosion will be addressed by appropriate erosion protection measures to reduce erosion and associated re-suspension of fine sediment.<br>Where practical, natural drainage patterns will be used to reduce the use of ditches or diversion berms. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. Water diverted around the mine footprint will be directed to waterbodies to augment changes in flows. The sub-watersheds to be affected by the Meliadine Extension are the same as those in the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 15 | Fish and Fish Habitat | Site Water Management during Construction and Operations: Dewatering of Project Footprint Lakes | Dewatering of Project Footprint Lakes may cause mortality and spoiling of fish. | Fish salvage in Project footprint lakes will be conducted to remove fish before and during dewatering; the fish-out programs will be designed and implemented in consultation with DFO and local Inuit communities, and will follow Tyson et al. (2011). | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. The sub-watersheds to be affected by the Meliadine Extension are the same as those in the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 16 | Fish and Fish Habitat | Site Water Management during Construction and Operation: Dewatering of Project Footprint Lakes | Impingement and entrainment of fish in intake pumps during dewatering may cause injury and mortality to fish, affecting abundance and distributions. | Appropriately sized fish screens, which meet DFO guidelines, will be fitted to pumps to limit fish access and to limit fish entrained to the smaller species and life stages. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |

**Table B-7: Fish and Fish Habitat - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Rationale |
|---|---|---|---|---|---|---|---|
| 17 | Fish and Fish Habitat | Pit development during Operations | Removal of inflows during pit development to local watersheds may alter water quality in local watersheds, and affect aquatic health and fish. | All of the open pits will be developed in permafrost; therefore, they are not connected to the deep groundwater regime. Contact water reporting to the pits will be mainly composed of runoff. Water inflow to the dewatered areas will not be directly released to local watersheds; Water reporting to the pits will be directed to the reclaim pond for re-use in the milling process. | No Linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS, 2018 FEIS Addendum, and the 2020 FEIS Addendum. The open pits will be developed in permafrost and are not connected to deep groundwater. However, any groundwater flows that report to the pits will be collected, treated, and discharged to Itivia Harbour. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS, 2018 FEIS Addendum, and the 2020 FEIS Addendum will be carried forward through the Meliadine Extension |
| 18 | Fish and Fish Habitat | Pit development during Operations | Blasting near fish-bearing waterbodies may result in pressure changes and vibrations, and affect fish mortality and reproduction. | Blasting will follow recommended guidelines for use of explosives in or near fisheries waters (e.g., based on instantaneous pressure change threshold of 50 kPa; Godard et al. 2008). | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 19 | Fish and Fish Habitat | Construction and operation of haul roads, AWAR and Rankin Inlet bypass road | Blasting near fish habitat may result in the physical and/or chemical alteration of the fish habitat. | Blasting will follow recommended DFO guidelines for use of explosives in or near Canadian fisheries waters. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 20 | Fish and Fish Habitat | Construction and operation of haul roads, AWAR and Rankin Inlet bypass road | Release of potential acid generating materials from road building materials at the watercourse crossings can alter water quality, affecting fish health and fish habitat quantity | Use of non-acid generating and non-metal leaching material at all watercourses.<br>Any PAG or high metal leaching waste rock will be segregated at source and placed into designated areas within the waste rock storage facilities. | No Linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 21 | Fish and Fish Habitat | Construction and operation of haul roads, AWAR and Rankin Inlet bypass road | Surface water drainage through quarries and transport of blasting residuals and metals directly into watercourses can affect surface water quality, affecting fish health and fish habitat quality. | Where possible, stockpiling of rock and fill from quarries and borrow sites will be placed such that surface water is not diverted through the piles with runoff to surface waterbodies.<br>Drainage from quarries will not flow directly into any waterbodies or watercourses.<br>Excavations will be at least 31 m away from any waterbodies.<br>Quarries will be excavated and sloped for positive drainage. Quarries will be inspected on a regular basis to monitor water ponding, particularly at spring melt; when there is flow from a quarry that could enter a waterbody, a water quality sample will be collected and analyzed. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 23 | Fish and Fish Habitat | Decommissioning of mining infrastructure, dikes and roads at closure (e.g., AWAR, road to Discovery, Rankin Inlet bypass road) | Sediment and contaminant releases during decommissioning activities can affect surface water quality, affecting fish habitat quality for fish. | Best management practices for erosion and sedimentation control will used.<br>All in-stream work will be limited to when watercourses are not flowing or when watercourses are frozen, as much possible.<br>Coarse rip-rap on the banks will be used to prevent erosion after removal of culverts.<br>Dikes will be breached to a minimum depth of 1 m below average lake water level or back to original and berms will be removed, these activities will be timed to minimize release of sediments.<br>Watersheds will be reconnected along previous connecting streams where possible. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 24 | Fish and Fish Habitat | Decommissioned tailings storage facility and waste rock storage facilities during Closure. | Runoff and seepage from decommissioned waste rock storage facilities and tailings storage facility may change downstream surface water and sediment quality (i.e., metal concentrations), and affect fish health and fish habitat quality. | A Conceptual Closure and Reclamation Plan has been developed and describes measures for permanent closure.<br>The waste rock storage facilities and tailings storage facility have been designed for long-term stability.<br>The top surface of the tailings and waste rock storage facilities will be graded to shed water from the surface. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 25 | Fish and Fish Habitat | Reclaimed waterbodies at Closure. | Water quality concentrations in the collection ponds may exceed objectives, and if reconnected to preconstruction flow paths may affect downstream water and sediment quality, affecting fish health and habitat quality. | A Conceptual Closure and Reclamation Plan has been developed and describes measures for permanent closure.<br>Sediments will be analyzed, and if concentrations are higher than baseline or guidelines, sediments will be managed according to best practices | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |

**Table B-7: Fish and Fish Habitat - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Rationale |
|---|---|---|---|---|---|---|---|
| 26 | Fish and Fish Habitat | Reclaimed waterbodies at Closure. | The permanent footprint will affect the connectivity of fish habitat within the Meliadine Lake Peninsula, affecting abundance and distribution of fish. | Hydraulic connections to the natural receiving environment will be re-established once water quality monitoring demonstrates the water meets water quality guidelines for direct release without further treatment.<br>Drainage patterns will be established as close to pre-construction conditions as possible, with drainage ditches contoured or backfilled as appropriate to remove hazards for wildlife.<br>Permanent diversion channels will be designed to provide fish habitat and conditions allowing for passage of Arctic char, Lake Trout, and Arctic grayling where necessary. | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS. There is no change to the assessment results for the Meliadine Extension. Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |

**Table B-8: Socio-Economics, Traditional Land Use, and Cultural Resources - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 1 | Population Demographic | Employment opportunities and Contracting opportunities (construction and operation) | Population Stability : Project induced in-migration to Rankin Inlet and out-migration from other communities | Points of hire in all communities.<br>Fully contained accommodation camp, fly in/fly out. Project Personnel will be flown between their home communities and Rankin Inlet, then transported on a company shuttle bus service to the mine site, minimizing time spent in Rankin Inlet<br>Local hiring and contracting priorities.<br>Clear communication on recruitment procedures. | Primary | Minor | Predictions from the 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. |
| 3 | Economic Development and Opportunities | Direct, indirect and induced spending on goods and services. | Employment by Industry: Project impacts on different industries would be different, both in terms of scope and timing. | Ensuring that the need for goods and services is mapped out and clarified as well as possible, so that local businesses, individuals and government can prepare and maximize the benefits. | Minor | Minor | Consistent with 2014 FEIS, mitigations measures are sufficient and no additional effects are expected with the Meliadine Extension |
| 4 | Economic Development and Opportunities | Use of infrastructure | Economic Infrastructure: Use of infrastructure might decrease its lifetime and leave less capacity for other users. | Minimize use of community infrastructure through on site services; road has public access but will be reclaimed during closure. | Minor | Minor | Consistent with 2014 FEIS, mitigations measures are sufficient and no additional effects are expected with the Meliadine Extension |
| 6 | Education and Training | Project related in migration. | Capacities of existing education system: In migration, depending on its volume, nature and timing, could lead to increased number of children of school-age, leading to higher admission rates and larger class sizes. This could put added strain on schools. | Continue monitoring through Kivalliq's Socio-Economic Monitoring Committee (SEMC).<br>Fully contained accommodation camp, fly in/fly out. Project Personnel will be flown between their home communities and Rankin Inlet, then transported on a company shuttle bus service to the mine site, minimizing time spent in Rankin Inlet | Primary | Minor | Predictions from the 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. |
| 7 | Education and Training | Increase in cost of living | Retention of school teachers | None required. | Minor | Minor | Consistent with 2014 FEIS, the Meliadine Extension is not expected to drive the cost of living up, which has been noted as an issue in retaining teachers. |
| 8 | Individual, Family and Community Well-being | Employment | Physical and mental health : Project may induce in-migration to Rankin Inlet leading to overcrowding of housing and detrimental public health effects | The Project will take measures to limit in-migration, such as clear messaging around recruitment. Project Personnel will be flown between their home communities and Rankin Inlet, then transported on a company shuttle bus service to the mine site, minimizing time spent in Rankin Inlet<br><br>Provide H&S training that can be implemented in communities (as well as for Project activities). | Minor | No linkage | Predictions from the 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. |
| 9 | Individual, Family and Community Well-being | Employment | Nutrition : Increased incomes from direct, indirect and induced Project employment may lead to changes in diet | Accommodate traditional pursuits of Inuit employees within work schedules where practicable and with appropriate notice, in balance with operational needs of the Project.<br><br>Access to Country Food | Minor | Minor | Consistent with the 2014 FEIS, while at the mine site, a variety of services to support use of country food at the Meliadine Mine site will continue to be available, including country food nights, country food events, and a country food kitchen for use by Inuit employees. |
| 10 | Individual, Family and Community Well-being | Employment | Housing: Long-term Project employment may enable people to rent/purchase private housing | Provide long-term employment with opportunities for advancement and growth.<br>Provide Financial Literacy Training and Financial Management Training during pre-employment (developed in collaboration with Nunavut Literacy Council). | Primary | Minor | While there is potential for mining projects to impact housing supply and demand, the data presented in the 2020 Socio-Economic Monitoring Report suggest that the Agnico Eagle projects are not having any substantial adverse effect on housing. |

**Table B-8: Socio-Economics, Traditional Land Use, and Cultural Resources - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 11 | Individual, Family and Community Well-being | Employment | Substance Abuse: Increased incomes from direct, indirect and induced Project employment may lead to increased substance abuse | Implement a worker code of conduct.<br>Offer Mental Health Initiatives and on-site social worker<br>Maintain Community Liaison Coordinator positions to work with communities throughout the Project.<br>Provide Financial Literacy Training and Financial Management Training during pre-employment (developed in collaboration with NLC). | Minor | Minor | Consistent with the 2014 FEIS conclusions about any necessary relationship between substance abuse and employment on the part of individuals, nor has monitoring in NT suggested any community level effects. The linkages between employment and substance abuse are therefore expected to vary from person to person. To the extent that there are individuals who abuse alcohol, GN services and public health education programs, as well as Agnico Eagle's on site counseling, Mental Health Initiatives and health and safety training are intended to both prevent and manage poor choices. |
| 12 | Individual, Family and Community Well-being | Employment | Crime: Increased incomes from direct, indirect and induced Project employment may lead to illegal behaviors. | Implement a worker code of conduct.<br>Offer Mental Health Initiatives and on-site social worker<br>Maintain Community Liaison Coordinator positions to work with communities throughout the Project.<br>Provide Financial Literacy Training and Financial Management Training during pre-employment (developed in collaboration with Nunavut Literacy Council) | Minor | Minor | The Socio-Economic Monitoring Report data does not support the 2014 FEIS prediction that the project will lead to increased mental stress and changes in behaviour. |
| 13 | Individual, Family and Community Well-being | Employment | Sexually transmitted infections : Project induced in-migration may result in higher levels of STI's (such as HIV) in the region | Implement a worker code of conduct.<br>Offer Mental Health Initiatives, on-site social worker and sexual health program.<br>Maintain Community Liaison Coordinator positions to work with communities throughout the Project.<br>Provide Financial Literacy Training and Financial Management Training during pre-employment (developed in collaboration with Nunavut Literacy Council) | Minor | No linkage | Predictions from the Meliadine 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. |
| 14 | Individual, Family and Community Well-being | Perceptions of harm | Safety : Perceptions of Project effects may lead to mental stress and changes in behaviour (i.e., Diet) | Maintain Community Liaison Coordinator positions to work with communities throughout the Project<br>Provide communities with results of wildlife and socio-economic monitoring studies.<br>Provide ongoing and informative information to communities.<br>Offer Mental Health Initiatives, Health clinic and presentations and on-site social worker | Minor | Minor | The 2020 Socio-Economic Monitoring Report data does not support the 2014 FEIS prediction that the project will lead to increased mental stress and changes in behaviour. |
| 15 | Individual, Family and Community Well-being | na | Family and community cohesion | Provide opportunities for job advancement through training programs<br>Offer Mental Health Initiatives, Health clinic and presentations and on-site social worker<br>Maintain Community Liaison Coordinator positions to work with communities throughout the Project.<br>Spouse Visits | Minor | Minor | No changes anticipated with the Meliadine Extension. The 2020 Socio-Economic Monitoring Report data does not support the 2014 FEIS prediction that the project will lead to increased mental stress and changes in behaviour. |
| 16 | Individual, Family and Community Well-being | na | Vulnerable Groups | Monitoring and collaboration with the Kivalliq Socio-Economic Monitoring Committee (SEMC)<br>Maintain a safe workplace for women workers and on a case by case basis, providing additional support to women applicants and employees to enhance the potential for employment success.<br>Offer Mental Health Initiatives, Health clinic and presentations and on-site social worker<br>Maintain Community Liaison Coordinator positions to work with communities throughout the Project. Civility at workplace program | Minor | Minor | Consistent with the 2014 FEIS, the Meliadine Extension is not expected to directly lead to an increase in vulnerability. The Project will however participate in Socio-Economic Monitoring (SEMP) and put in place management and mitigation. |

**Table B-8: Socio-Economics, Traditional Land Use, and Cultural Resources - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 17 | Individual, Family and Community Well-being | na | Family Function and Domestic Violence: Project may change gender roles, potentially resulting in increased family violence | Work through Skills Canada, Government of Nunavut, Nunavut Arctic College and others to promote equal opportunity for men and women in trades and mining occupations.<br>Work with the GN and the KIA to offer scholarships, awards and apprenticeship programs to Nunavummiut students who are attending college and university programs.<br>Make role models available for school programs to promote working in the mining sector and/or at the Project<br>Designing recruitment methods, advertisements, application procedure, interview protocols, selection procedures, and training and promotion decision making that reduce artificial barriers and promote widespread participation of qualified individuals<br>Making available Elders, peer counsellors and staff in community offices with some competence to ease work/life balance challenges<br>Maintaining a safe workplace for women workers and on a case by case basis, providing additional support to women applicants and employees to enhance the potential for employment success<br>Encourage contractors to participate and Agnico Eagle's commitments related to employment equity in the workforce | Minor | Minor | No additional effects are anticipated with the Meliadine Extension. Existing management and mitigation measures will continue to be applied, such as on-site social worker and mental health initiatives. |
| 18 | Individual, Family and Community Well-being | na | Gambling: Increased incomes from direct, indirect and induced Project employment may potentially result in increased gambling | Implement a worker code of conduct, gambling prohibited at the Mine Site<br>Offer Mental Health Initiatives, on-site social worker.<br>Maintain Community Liaison Coordinator positions to work with communities throughout the Project.<br>Provide Financial Literacy Training and Financial Management Training | Minor | Minor | No change anticipated with the Meliadine Extension, 2014 FEIS mitigations measures will continue to apply such as the Financial Management Training during pre-employment (developed in collaboration with NLC). |
| 19 | Individual, Family and Community Well-being | na | Crime: The Project may result in increased alcohol consumption leading to crime | Implement a worker code of conduct<br>Offer Mental Health Initiatives, on-site social worker.<br>Maintain Community Liaison Coordinator positions to work with communities throughout the Project.<br>Provide Financial Literacy Training and Financial Management Training during pre-employment (developed in collaboration with NLC). | Minor | Minor | No change anticipated with the Meliadine Extension, 2014 FEIS mitigations measures will continue to apply such as the Financial Management Training during pre-employment (developed in collaboration with NLC). |
| 20 | Individual, Family and Community Well-being | na | Crime: The Project may result in increased social inequality leading to higher crime rates | Implement a worker code of conduct<br>Offer Mental Health Initiatives and on-site social worker.<br>Maintain Community Liaison Coordinator positions to work with communities throughout the Project.<br>Provide Financial Literacy Training and Financial Management Training during pre-employment (developed in collaboration with NLC). | Minor | Minor | No change anticipated with the Meliadine Extension, 2014 FEIS mitigations measures will continue to apply. |
| 21 | Individual, Family and Community Well-being | Employment and Training; Project Infrastructure | Savings : The Project will offer financial management training which may encourage better money management practices | Provide Financial Literacy Training and Financial Management Training during pre-employment (developed in collaboration with NLC). | Minor | Minor | Consistent with 2014 FEIS, continued Financial Management Training during pre-employment (developed in collaboration with NLC). |
| 22 | Individual, Family and Community Well-being | Employment and Training; Project Infrastructure | The Project may result in increased percentage of Territorial savings being exported out of Nunavut by out of Territory employees | Maintain Community Liaison Coordinator positions to work with communities throughout the Project. | Primary | Minor | Predictions from the 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. In the 2014 FEIS, it was believed that savings by non-residents who do not invest in the territory but take their savings with them when they move. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. |

**Table B-8: Socio-Economics, Traditional Land Use, and Cultural Resources - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 23 | Individual, Family and Community Well-being | Traffic | Safety: A higher number of Project vehicles in Rankin Inlet may increase the risk of traffic accidents | Post traffic signage clearly with speed controls on the AWAR and usage of the by-pass road to limit traffic.<br>Project Personnel will be flown between their home communities and Rankin Inlet, then transported on a company shuttle bus service to the mine site, minimizing time spent in Rankin Inlet | Minor | Minor | No anticipated effect from Meliadine Extension. Traffic signage and speed limit implemented on AWAR. Bypass road completed, substantially reduces risk of traffic with local vehicles. On-going training and respect of speed limits. No project induced in-migration. As a result, no additional traffic. |
| 24 | Individual, Family and Community Well-being | Construction and operations | Financial Services: Project-induced in-migration may increase demand on financial services | Maintain Community Liaison Coordinator positions to work with communities throughout the Project<br>Project Personnel will be flown between their home communities and Rankin Inlet, then transported on a company shuttle bus service to the mine site, minimizing time spent in Rankin Inlet | Primary | Minor | No-project induced in migration expected for the Meliadine Extension. Predictions from the 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. |
| 25 | Individual, Family and Community Well-being | Construction and operations | Police: Project-induced in-migration may increase demand on protective services | Post traffic signage clearly with speed controls on the AWAR<br>Report any illegal activity or violence to authorities<br>Project Personnel will be flown between their home communities and Rankin Inlet, then transported on a company shuttle bus service to the mine site, minimizing time spent in Rankin Inlet<br>Provide Financial Literacy Training and Financial Management Training during pre-employment (developed in collaboration with NLC). | Primary | Minor | No-project induced in migration expected for the Meliadine Extension. Predictions from the 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. |
| 26 | Community Infrastructures and Public Services | Construction and operations | Housing : Project workforce may increase demand on local housing | A fully catered permanent camp will be built on the site to accommodate employees, along with other infrastructure appropriate to a remote mine site<br>Project Personnel will be flown between their home communities and Rankin Inlet, then transported on a company shuttle bus service to the mine site, minimizing time spent in Rankin Inlet | No linkage | No linkage | No-project induced in migration expected for the Meliadine Extension. Predictions from the 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. Additionally, employees will continue being on rotations. |
| 27 | Community Infrastructures and Public Services | Construction and operations | Schools : Project-induced in-migration may increase demand on educational facilities | Recruitment and hiring practices will be communicated clearly to discourage people from moving to Rankin Inlet without secure employment.<br>Project Personnel will be flown between their home communities and Rankin Inlet, then transported on a company shuttle bus service to the mine site, minimizing time spent in Rankin Inlet | Primary | Minor | No-project induced in migration expected for the Meliadine Extension. Predictions from the 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. |
| 28 | Community Infrastructures and Public Services | Construction and operations | Health Services : Project-induced in-migration may increase demand on health services | Limits on speeds and on the use of firearms along the road and an appropriate buffer<br>Securing the Project site in the interests of public health and safety, and advertising these security arrangements widely, to protect people from health effects that might be caused by access to closed facilities and/or land and water that may still be exhibiting environmental effects<br>Gate house for support in case of emergency | Primary | Minor | No-project induced in migration expected for the Meliadine Extension. Predictions from the 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. |
| 29 | Community Infrastructures and Public Services | Construction and operations | Communication : Project-induced in-migration may increase demand on communication services | Recruitment and hiring practices will be communicated clearly to discourage people from moving to Rankin Inlet without secure employment<br>Project Personnel will be flown between their home communities and Rankin Inlet, then transported on a company shuttle bus service to the mine site, minimizing time spent in Rankin Inlet | Primary | Minor | No-project induced in migration expected for the Meliadine Extension. Predictions from the 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. |

**Table B-8: Socio-Economics, Traditional Land Use, and Cultural Resources - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 30 | Community Infrastructures and Public Services | Construction and operations | Other community infrastructure and services : Project-induced in-migration may increase demand on other community infrastructure and services | Recruitment and hiring practices will be communicated clearly to discourage people from moving to Rankin Inlet without secure employment<br>Project Personnel will be flown between their home communities and Rankin Inlet, then transported on a company shuttle bus service to the mine site, minimizing time spent in Rankin Inlet | Primary | Minor | No-project induced in migration expected for the Meliadine Extension. Predictions from the Meliadine 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. |
| 31 | Community Infrastructures and Public Services | Construction and operations | Housing: Project-induced in-migration may increase demand on local housing | Recruitment and hiring practices will be communicated clearly to discourage people from moving to Rankin Inlet without secure employment<br>Project Personnel will be flown between their home communities and Rankin Inlet, then transported on a company shuttle bus service to the mine site, minimizing time spent in Rankin Inlet<br>A fully catered permanent camp will be built on the site to accommodate employees, along with other infrastructure appropriate to a remote mine site | Primary | Minor | No-project induced in migration expected for the Meliadine Extension. Predictions from the 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. |
| 32 | Community Infrastructures and Public Services | Construction and operations | Accidents involving Project workers may increase demand on health services | Provide a first responder medical station at the accommodation camp facilities to meet workers' medical needs while at site, in order to limit the demand for Rankin Inlet and other governmental health facilities for work related injuries<br>Taking into account health and safety issues in conditions placed on public use of the Project access roads; for example the setting of limits on speeds and on the use of firearms along the road and an appropriate buffer<br>Driver training and enforcement of a driver code of conduct, to control speeds and encourage considerate driving | No Linkage | No Linkage | No linkages as the Meliadine Extension will continue using the on-site medical clinic. |
| 33 | Community Infrastructures and Public Services | Construction and operations | Project personnel may increase demand on social services | Project Personnel will be flown between their home communities and Rankin Inlet, then transported on a company shuttle bus service to the mine site, minimizing time spent in Rankin Inlet<br>Offer Mental Health Initiatives, Health clinic and presentations and on-site social worker<br>Maintain Community Liaison Coordinator positions to work with communities throughout the Project. | No Linkage | No Linkage | No-project induced in migration expected for the Meliadine Extension. Predictions from the 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. |
| 34 | Community Infrastructures and Public Services | Construction and operations | Project personnel may increase demand on police services | Project Personnel will be flown between their home communities and Rankin Inlet, then transported on a company shuttle bus service to the mine site, minimizing time spent in Rankin Inlet<br>Offer Mental Health Initiatives, Health clinic and presentations and on-site social worker | No Linkage | No Linkage | No-project induced in migration expected for the Meliadine Extension. Predictions from the 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. |
| 35 | Community Infrastructures and Public Services | Construction and operations | Project-induced in-migration may increase demand on religious services | Recruitment and hiring practices will be communicated clearly to discourage people from moving to Rankin Inlet without secure employment<br>Project Personnel will be flown between their home communities and Rankin Inlet, then transported on a company shuttle bus service to the mine site, minimizing time spent in Rankin Inlet | No Linkage | No Linkage | No-project induced in migration expected for the Meliadine Extension. Predictions from the 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. |

**Table B-8: Socio-Economics, Traditional Land Use, and Cultural Resources - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 36 | Community Infrastructures and Public Services | Construction and operations | Project personnel may increase demand on financial services | Project Personnel will be flown between their home communities and Rankin Inlet, then transported on a company shuttle bus service to the mine site, minimizing time spent in Rankin Inlet.<br>Financial Literacy Training<br>Financial Management Training during pre-employment | No Linkage | No Linkage | No-project induced in migration expected for the Meliadine Extension. Predictions from the 2014 FEIS believed that we would see project induced in-migration to Rankin Inlet and out-migration from other Kivalliq communities to Rankin Inlet. Although, based on current data from the 2020 Socio-Economic Monitoring Report, there is no indication of mining-induced in-migration. |
| 37 | Community Infrastructures and Public Services | Post-closure | Project facilities and infrastructure and the AWAR may be available for use by local people | Project facilities, infrastructure and the AWAR will be removed post-closure | No Linkage | No Linkage | Consistent with the 2014 FEIS. |
| 38 | Public and Worker Health and Safety | All activities in all phases of the Project<br><br>Transportation of employees, contractors, good and services for Project activities | Good Health and Safety Performance for the Project : Health and Safety training and culture may result in increased health and safety capacity with employee families and community members in the LSA | None required. | Minor | Minor | Consistent with the 2014 FEIS. The Meliadine Extension is anticipated to continue enhancing health and safety at the mine site and outside of the workplace by continued on the job health and safety training program. |
| 39 | Traditional Activities and Knowledge | All phases of the Project | Changes in availability and quality of traditional foods. | Discharge to the receiving environment (i.e Meliadine Lake and Itivia Harbour) will comply with applicable criteria. Monitoring will be completed in the receiving environment to confirm predictions.<br>Mitigation and monitoring outlined in the Terrestrial Environment Monitoring and Management Plan will be followed when caribou are in proximity of the mine site and AWAR.<br>Provide employee with healthy food choices while on site. Continued used of country food kitchen and country food nights. | Primary | Minor | The 2020 Socio-Economic Monitoring Report data does not support the 2014 FEIS prediction that the project will lead to increased mental stress and changes in behaviour (i.e., diet). Agnico Eagle projects offer potential pathways that may positively impact food security in the Kivalliq. This includes providing employees with healthy food choices while on site, increasing household incomes which makes food more affordable, and enhancing the availability and accessibility of country food. While at the mine site, a variety of services to support use of country food will continue to be available, including country food nights, country food events, and a country food kitchen for use by Inuit employees.<br><br>Availability of wildlife for harvesting are consistent with the 2014 FEIS and the same mitigation measures will continue to apply. |
| 40 | Cultural, Archaeological and Paleontological Resources | Mine Infrastructure (e.g., open pits, site roads, blasting, water management), All-weather Access Road, and Rankin Inlet Infrastructure | Construction activity leading to ground alteration that affects physical heritage resources | Complete heritage assessment for the Project footprint.<br>Provide awareness training to all employees as part of the mandatory e-learning training<br>Avoid previously recorded heritage resource sites.<br>Complete additional heritage assessment for any changes to the Project footprint in areas considered to have moderate to high potential to contain heritage resources.<br>Complete more in-depth mitigation strategies if an avoidance mitigation strategy cannot be implemented.<br>Monitor condition of known heritage resource sites near the Project footprint. | Minor | Minor | Consistent with the 2014 FEIS and the 2018 and 2020 Addenda. Since all sites which will be impacted by the Meliadine Extension either have, or will be mitigated using standard archaeological methods, none of the impacts to the archaeological sites are considered to contribute to significant residual effects on the overall archaeological record baseline because a record of the site has been documented and will be preserved in permit reports |

**Table B-8: Socio-Economics, Traditional Land Use, and Cultural Resources - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 41 | Cultural, Archaeological and Paleontological Resources | Closure and Post-Closure of Mine Infrastructure, All-Weather Access Road, and Rankin Inlet Infrastructure | Closure and Reclamation and post-closure activities such as scarifying roads, breaching of dikes, removal buildings and monitoring access that affects physical heritage resources | Complete heritage assessment for the Project footprint.<br>Provide awareness training to all employees as part of the mandatory e-learning training<br>Avoid previously recorded heritage resource sites.<br>Complete additional heritage assessment for any changes to the Project footprint in areas considered to have moderate to high potential to contain heritage resources.<br>Complete more in-depth mitigation strategies if an avoidance mitigation strategy cannot be implemented.<br>Monitor condition of known heritage resource sites near the Project footprint. | Minor | Minor | Consistent with the 2014 FEIS and the 2018 and 2020 Addenda. Since all sites which will be impacted by the Meliadine Extension either have, or will be mitigated using standard archaeological methods, none of the impacts to the archaeological sites are considered to contribute to significant residual effects on the overall archaeological record baseline because a record of the site has been documented and will be preserved in permit reports |

**Table B-9: Marine Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014, 2018, 2020 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 1 | Water Quality | Vessel movements in the proposed shipping corridor and Itivia Bay including near-shore transportation of fuel and dry goods (loading barges, barging, off-loading) | Vessel wakes from nearshore vessels may cause shoreline erosion, which can result in adverse effects to marine water quality with associated indirect effects on marine wildlife. | Vessels navigating in Itivia Harbour will travel at reduced speeds (≤2 knots). | Minor | Minor | No change to vessel movement activities as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 2 | Water Quality | | Propeller wash from nearshore vessels berthing at the spud barge / landing ramp may result in adverse effects to marine water quality, with associated indirect effects on marine wildlife. | Placement of spud barge will avoid sensitive natural habitats. To the extent possible, vessel will shut-down vessel engines and propellers when anchored or tied to the spud barge. | Minor | No Linkage | No change to marine activities as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 3 | Water Quality | | Solid waste, grey water, and bilge water discharges from ships may result in direct adverse effects on marine water quality in the proposed shipping corridor and associated indirect effects on marine wildlife. | Adherence to MARPOL Convention, Protocols and Annexes as set out by the International Maritime Organization (IMO 2008; MARPOL 73/78).<br>Adherence to mitigation outlined in Shipping Management Plan. | Minor | No Linkage | No change to marine activities as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 4 | Water Quality | | Introduction of exotic marine species (including pathogens) from ship ballast water exchange during seasonal shipping events can affect native marine wildlife. | Adherence to Ballast Water Management Plan (BWMP) as defined in the Shipping Management Plan.<br>Adherence to mitigation outlined in Shipping Management Plan. | Minor | No Linkage | No change to marine activities as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 5 | Water Quality | | Antifouling toxins (e.g., tributyltin) potentially leaching from Meliadine Mine vessels can have an effect on the marine environment and bio-accumulation in marine food chains. | Adherence to MARPOL Convention, Protocols and Annexes as set out by the International Maritime Organization (IMO 2008; MARPOL 73/78).<br>Adherence to mitigation outlined in Shipping Management Plan. | Minor | No Linkage | No change to marine activities as part of the Meliadine Extension. Mitigation measures outlined in the2014 FEIS will be carried forward through the Meliadine Extension. |
| 6 | Water Quality | | Accidental spills of dry cargo (loading and off-loading barges) can have direct adverse effects on marine water quality and associated indirect effects on marine wildlife. | Adherence to Spill Contingency Plan, Risk Management and Emergency Response Plan, and Shipping Management Plan.<br>Adherence to MARPOL Convention, Protocols and Annexes as set out by the International Maritime Organization (IMO 2008; MARPOL 73/78); Canada Shipping Act; and Arctic Waters Pollution Prevention Act. Operational activities have been engineered to use contained handling systems to minimize the risk of accidental spills into the marine environment. | Minor | No Linkage | No change to marine activities as part of the Meliadine Extension. Agnico Eagle has conducted modelling studies indicating that water quality in these areas will not change from background due to the 2014 FEIS and Meliadine Extension.<br><br>The lack of linkage between the 2014 FEIS and Meliadine Extension and potential health risks can be traced to multiple lines of evidence: physical barriers between the discharge area and shoreline harvesting areas, quality of the discharge, and size and quality of the receiving environment. In addition, the assumptions applied through the assessment of the 2014 FEIS and Meliadine Extension and the modelling results will be validated through monitoring. Consultation activities revealed that the Itivia Harbour is not considered as a primary location of harvesting for mussels and shellfishes by the community.<br>Mitigation measures outlined in the 2014FEIS will be carried forward through the Meliadine Extension. |
| 7 | Benthic Invertebrates | Installation and presence of discharge pipe | Change in health and survivorship of marine benthic invertebrates due to in-water works and presence of discharge pipe. | Placement of discharge pipe will avoid sensitive natural habitats.<br>Construction and installation of the discharge pipe will adhere to DFO guidance practices of “Measures to Protect Fish and Fish Habitat", and guidance provided in the Erosion and Sediment Control Plan.<br>Best management practices for erosion and sedimentation control will be used to control sediment releases during construction and installation of the discharge pipe and associated structures (e.g., silt curtains, runoff management). | Minor | Minor | No change to marine activities as part of the Meliadine Extension. Discharged water will be rapidly mixed within a few meters of the discharge point; the area of mixed (or unmixed) discharge is very small, and the residence time of any aquatic animal (i.e., fish) passing close to the end of pipe will be very short. Mitigation measures outlined in the 2014 FEIS and 2018 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 8 | Marine Fish and Fish Habitat | | Change in marine fish habitat quality due to in-water works and presence of discharge pipe. | Placement of pipe will avoid sensitive natural habitats.<br>Construction and installation of the discharge pipe will adhere to DFO guidance practices of “Measures to Protect Fish and Fish Habitat" and guidance provided in the Erosion and Sediment Control Plan.<br>Best management practices for erosion and sedimentation control will be used to control sediment releases during construction and installation of the discharge pipe and associated structures (e.g., silt curtains, runoff management). | Minor | Minor | No change to marine activities as part of the Meliadine Extension. Discharged water will be rapidly mixed within a few meters of the discharge point; the area of mixed (or unmixed) discharge is very small, and the residence time of any fish passing close to the end of pipe will be very short. Mitigation measures outlined in the 2014 FEIS and 2018 FEIS Addendum will be carried forward through the Meliadine Extension. |

**Table B-9: Marine Environment - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014, 2018, 2020 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 9 | Marine Fish and Fish Habitat | | Change in health and survivorship of marine fish due to in-water works and presence of discharge pipe. | The hierarchy of DFO concepts of “avoid, mitigate and offset” will be implemented as a best practice in reducing risks to aquatic biodiversity.<br>Placement of pipe will avoid sensitive natural habitats.<br>Construction and installation of the discharge pipe will adhere to DFO guidance practices of “Measures to Protect Fish and Fish Habitat" and guidance provided in the Erosion and Sediment Control Plan.<br>Best management practices for erosion and sedimentation control will be used to control sediment releases during construction and installation of the discharge pipe and associated structures (e.g., silt curtains, runoff management). | Minor | Minor | No change to marine activities as part of the Meliadine Extension. to marine activities as part of the Meliadine Extension. Discharged water will be rapidly mixed within a few meters of the discharge point; the area of mixed (or unmixed) discharge is very small, and the residence time of any fish passing close to the end of pipe will be very short. Mitigation measures outlined in the 2014 FEIS and 2018 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 10 | Marine sediment quality and water quality | | Disturbance of nearshore or seabed material from in-water construction will impact both sediment and water quality. | Installation of the diffuser to allow discharge increase.<br>A crew of divers will install the submerged portion of the pipe to connect, bolt, and torque the flanges together and that the diffuser is sitting flat at the right depth.<br>Installation of a diffuser to encourage mixing. | Minor | Minor | No change to marine activities as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS and 2018 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 11 | Marine fish and Fish Habitat | Discharging treated saline effluent into marine environment | Change in fish habitat quality due to discharge of treated saline effluent from the Meliadine Mine. | Discharge of effluent will meet regulatory requirements for both temperature and applicable water quality guidelines.<br>If the treated saline effluent is not suitable for discharge, it will be stored at the Meliadine Mine and treated prior to discharge.<br>Design, construct, and install a diffuser with the discharge pipe to aid in mixing.<br>Monitoring program will be established, and adaptive management implemented if negative impacts are detected. | Minor | Minor | No change to marine activities as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS and 2018 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 12 | Marine Fish and Fish Habitat | | Change in health and survivorship of due to the quality of the treated saline effluent discharge from the Meliadine Mine | Discharge of effluent will meet regulatory requirements for both temperature and applicable water quality guidelines.<br>Toxicity testing will be completed on the treated groundwater to confirm it is acceptable for release (i.e., is not -acutely toxic).<br>If the treated groundwater is not suitable for discharge, it will be stored at the Meliadine Mine and treated prior to discharge.<br>Design, construct, and install a diffuser with the discharge pipe to aid in mixing.<br>Monitoring program will be established, and adaptive management implemented if negative impacts are detected. | Minor | Minor | No change to marine activities as part of the Meliadine Extension. Shellfish tend to be found in the intertidal zone and are generally sparse in the intertidal area proximal to the diffuser (Agnico Eagle 2014; 2020a). Therefore, Agnico Eagle feels there is no physical linkage between the mixing zone around the diffuser and the tidal flats related to harvesting. In addition, community members identified shellfish harvesting areas that are far removed from the discharge area and the mixing zone area. The size of the mixing zone area, and predicted change to water quality, is discussed further in the sub-section “Size and Quality of the Receiving Environment”. Based on this, there is no operable pathway between the 2014 FEIS and Meliadine Extension and areas where people may harvest mussel and other shellfish country foods. Mitigation measures outlined in the 2014 FEIS and 2018 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 13 | Benthic Invertebrates | | Change in benthic invertebrates habitat quality due to the quality of the treated saline effluent discharge from the Meliadine Mine | Discharge of effluent will meet regulatory requirements for both temperature and applicable water quality guidelines.<br>If the treated saline effluent is not suitable for discharge, it will be stored at the Meliadine Mine and treated prior to discharge.<br>Design, construct, and install a diffuser with the discharge pipe to aid in mixing.<br>Monitoring program will be established | Minor | Minor | No change to marine activities as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS and 2018 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 14 | Benthic Invertebrates | | Change in health and survivorship of due to the quality of the treated saline effluent discharge from the Meliadine Mine | Discharge of effluent will meet regulatory requirements for both temperature and applicable water quality guidelines.<br>Toxicity testing will be completed on the treated saline effluent to confirm it is acceptable for release and non-acutely toxic.<br>If the treated saline effluent is not suitable for discharge, it will be stored at the Meliadine Mine and treated prior to discharge. | Minor | Minor | No change to marine activities as part of the Meliadine Extension. Mitigation measures outlined in the 2014 FEIS and 2018 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 15 | Benthic Invertebrates<br>Marine Fish and Fish Habitat | | Reduction in sea ice thickness and or timing of seasonal freeze-up could impact marine habitat quality. | Discharge water temperature as close to the natural discharge as practicable.<br>Discharge in the summer months only. | No Linkage | No Linkage | No change to discharge of treated effluent activity as part of the Meliadine Extension. There is no discharge under-ice therefore there is no link to changing sea ice thickness. Mitigation measures outlined in the 2014 FEIS and 2018 FEIS Addendum will be carried forward through the Meliadine Extension. |

**Table B-10: Marine Wildlife - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014, 2018, and 2020 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 1 | Marine birds<br>Marine Mammals | Installation of in-water structures (spud barge) and support activities | Change in marine habitat quality due to grounding of spud and cargo barges. | Placement of spud barge will avoid sensitive natural habitats. | No linkage | No linkage | No change to the spud barge and support activities. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 2 | Fish<br>Marine birds<br>Marine mammals | Vessel movements in the proposed shipping corridor and Itivia Harbour including nearshore transportation of fuel and dry goods (loading barges, barging, offloading) | Vessel wakes from nearshore vessels may cause shoreline erosion, which can result in adverse effects to marine water quality with associated indirect effects on marine wildlife. | Vessels navigating in Itivia Harbour will travel at reduced speeds (≤2 knots). | Minor | Minor | No change to the shipping volumes from the 2014 FEIS. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 3 | Fish<br>Marine birds<br>Marine mammals | Vessel movements in the proposed shipping corridor and Itivia Harbour including nearshore transportation of fuel and dry goods (loading barges, barging, offloading) | Propeller wash from nearshore vessels berthing at the spud barge / landing ramp may result in adverse effects to marine water quality, with associated indirect effects on marine wildlife. | Placement of spud barge will avoid sensitive natural habitats.<br>To the extent possible, vessel will shut-down vessel engines and propellers when anchored or tied to the spud barge. | Minor | Minor | No change to the shipping volumes from the 2014 FEIS. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 4 | Fish<br>Marine birds<br>Marine mammals | Vessel movements in the proposed shipping corridor and Itivia Harbour including nearshore transportation of fuel and dry goods (loading barges, barging, offloading) | Solid waste, grey water, and bilge water discharges from ships may result in direct adverse effects on marine water quality in the proposed shipping corridor and associated indirect effects on marine wildlife. | Adherence to MARPOL Convention, Protocols and Annexes as set out by the International Maritime Organization (IMO, 2008; MARPOL 73/78).<br><br>Adherence to mitigation outlined in the Shipping Management Plan. | Minor | Minor | No change to the shipping volumes from the 2014 FEIS. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 5 | Fish<br>Marine birds<br>Marine mammals | Vessel movements in the proposed shipping corridor and Itivia Harbour including nearshore transportation of fuel and dry goods (loading barges, barging, offloading) | Introduction of exotic marine species (including pathogens) from ship ballast water exchange during seasonal shipping events can affect native marine wildlife. | Adherence to Ballast Water Control and Management Regulations and Ballast Water Management Plan (BWMP) as defined in the Shipping Management Plan.<br><br>Adherence to mitigation outlined in the Shipping Management Plan. | Minor | Minor | No change to the shipping volumes from the 2014 FEIS. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 6 | Fish<br>Marine birds<br>Marine mammals | Vessel movements in the proposed shipping corridor and Itivia Harbour including nearshore transportation of fuel and dry goods (loading barges, barging, offloading) | Antifouling toxins (e.g., tributyltin) potentially leaching from Meliadine Mine vessels can have an effect on the marine environment and bio-accumulation in marine food chains. | Adherence to MARPOL Convention, Protocols and Annexes as set out by the International Maritime Organization (IMO, 2008; MARPOL 73/78).<br><br>Adherence to mitigation outlined in the Shipping Management Plan. | Minor | Minor | No change to the shipping volumes from the 2014 FEIS. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 7 | Marine birds | Vessel movements in the proposed shipping corridor and Itivia Harbour including nearshore transportation of fuel and dry goods (loading barges, barging, offloading) | Change in bird behavior due to underwater noise from vessel activities | Adherence to mitigation outlined in the Shipping Management Plan | No linkage | No linkage | No change to the shipping volumes from the 2014 FEIS. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 8 | Marine birds | Vessel movements in the proposed shipping corridor and Itivia Harbour including nearshore transportation of fuel and dry goods (loading barges, barging, offloading) | Vessel movements in Itivia Harbour and the shipping corridor may result in collisions with marine birds (change in health and survival) | Adherence to mitigation outlined in the Shipping Management Plan | Minor | Minor | No change to the shipping volumes from the 2014 FEIS. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. No collisions to date between ship and marine bird. |
| 9 | Fish<br>Marine birds<br>Marine mammals | Vessel movements in the proposed shipping corridor and Itivia Harbour including nearshore transportation of fuel and dry goods (loading barges, barging, offloading) | Accidental spills of dry cargo (loading and off-loading barges) can have direct adverse effects on marine water quality and associated indirect effects on marine wildlife. | Adherence to Spill Contingency Plan, Risk Management and Emergency Response Plan, Shipping Management Plan, Oil Pollution Emergency Plan .<br>Compliance with Shipboard Oil Pollution Emergency Plan (SOPEP).<br>Adherence to MARPOL Convention, Protocols and Annexes as set out by the International Maritime Organization (IMO, 2008; MARPOL 73/78); Canada Shipping Act; and Arctic Waters Pollution Prevention Act.<br>Operational activities have been engineered to use contained handling systems to minimize the risk of accidental spills into the marine environment. | Minor | Minor | No change to the shipping volumes from the 2014 FEIS. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |

**Table B-10: Marine Wildlife - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014, 2018, and 2020 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 10 | Benthic Invertebrates | Installation and presence of discharge pipe | Change in health and survivorship of marine benthic invertebrates due to in-water works and presence of discharge pipe. | Placement of discharge pipe will avoid sensitive natural habitats.<br>Construction and installation of the discharge pipe will adhere to DFO guidance practices of “Measures to Protect Fish and Fish Habitat", and guidance provided in the Erosion and Sediment Control Plan.<br>Best management practices for erosion and sedimentation control will be used to control sediment releases during construction and installation of the discharge pipe and associated structures (e.g., silt curtains, runoff management) | Minor | Minor | No change to the discharge strategy. Mitigation measures outlined in the 2020 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 11 | Marine Fish and Fish Habitat | Installation and presence of discharge pipe | Change in marine fish habitat quality due to in-water works and presence of discharge pipe. | Placement of pipe will avoid sensitive natural habitats.<br>Construction and installation of the discharge pipe will adhere to DFO guidance practices of “Measures to Protect Fish and Fish Habitat" and guidance provided in the Erosion and Sediment Control Plan.<br>Best management practices for erosion and sedimentation control will be used to control sediment releases during construction and installation of the discharge pipe and associated structures (e.g., silt curtains, runoff management) | Minor | Minor | No change to the discharge strategy. Mitigation measures outlined in the 2020 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 12 | Marine Fish and Fish Habitat | Installation and presence of discharge pipe | Change in health and survivorship of marine fish due to in-water works and presence of discharge pipe. | The hierarchy of DFO concepts of “avoid, mitigate and offset” will be implemented as a best practice in reducing risks to aquatic biodiversity.<br>Placement of pipe will avoid sensitive natural habitats.<br>Construction and installation of the discharge pipe will adhere to DFO guidance practices of “Measures to Protect Fish and Fish Habitat" and guidance provided in the Erosion and Sediment Control Plan.<br>Best management practices for erosion and sedimentation control will be used to control sediment releases during construction and installation of the discharge pipe and associated structures (e.g., silt curtains, runoff management) | Minor | Minor | No change to the discharge strategy. Mitigation measures outlined in the 2020 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 13 | Marine birds and marine mammals | Installation and presence of discharge pipe | Change in marine habitat quality due to in-water works related the discharge pipe and diffuser to and presence of discharge pipe. | Placement of pipe will avoid sensitive natural habitats.<br>Best management practices for erosion and sedimentation control will be used to control sediment releases during construction and installation of the discharge pipe and associated structures (e.g., silt curtains, runoff management) | No linkage | No linkage | No change to the discharge strategy. Mitigation measures outlined in the 2020 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 14 | Marine birds | Discharging treated saline effluent into marine environment | Sensory disturbance from structural lighting may result in changes in health and mortality risk in marine birds due to collisions with infrastructure. | Where feasible, lights on infrastructure will be shielded and/or angled to minimize direct illumination and reflection of the sea surface.<br>Activities will be scheduled during daylight hours whenever practical to minimize the need for staging lights. Work will occur during summer when daylight is extended, minimizing the need for site lighting. | Minor | Minor | No change to the discharge strategy. Mitigation measures outlined in the 2020 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 15 | Marine birds | Discharging treated saline effluent into marine environment | Sensory disturbance from structural lighting and in-air noise from nearshore human activities may alter marine bird behavior. | Where feasible, lights on infrastructure will be shielded and/or angled to minimize direct illumination and reflection of the sea surface.<br>Activities will be scheduled during daylight hours whenever practical to minimize the need for staging lights. Work will occur during summer when daylight is extended, minimizing the need for site lighting. | Minor | Minor | No change to the discharge strategy. Mitigation measures outlined in the 2020 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 16 | Marine Fish and Fish Habitat | Discharging treated saline effluent into marine environment | Change in fish habitat quality due to discharge of treated saline effluent from the Meliadine Mine. | Discharge of effluent will meet regulatory requirements for both temperature and applicable water quality guidelines.<br>If the treated saline effluent is not suitable for discharge, it will be stored at the Meliadine Mine and treated prior to discharge.<br>Design, construct, and install a diffuser with the discharge pipe to aid in mixing.<br>Monitoring program will be established, and adaptive management implemented if negative impacts are detected. | Minor | Minor | No change to the discharge strategy. Mitigation measures outlined in the 2020 FEIS Addendum will be carried forward through the Meliadine Extension. |

**Table B-10: Marine Wildlife - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014, 2018, and 2020 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 17 | Marine Fish and Fish Habitat | Discharging treated saline effluent into marine environment | Change in health and survivorship of marine fish due to the quality of the treated saline effluent discharge from the Meliadine Mine | Discharge of effluent will meet regulatory requirements for both temperature and applicable water quality guidelines.<br>Toxicity testing will be completed on the treated groundwater to confirm it is acceptable for release (i.e., is not -acutely toxic).<br>If the treated groundwater is not suitable for discharge, it will be stored at the Meliadine Mine and treated prior to discharge.<br>Design, construct, and install a diffuser with the discharge pipe to aid in mixing.<br>Monitoring program will be established, and adaptive management implemented if negative impacts are detected. | Minor | Minor | No change to the discharge strategy. Mitigation measures outlined in the 2020 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 18 | Benthic Invertebrates | Discharging treated saline effluent into marine environment | Change in health and survivorship of benthic invertebrates due to the quality of the treated saline effluent discharge from the Meliadine Mine | Discharge of effluent will meet regulatory requirements for both temperature and applicable water quality guidelines.<br>Toxicity testing will be completed on the treated saline effluent to confirm it is acceptable for release and non-acutely toxic.<br>If the treated saline effluent is not suitable for discharge, it will be stored at the Meliadine Mine and treated prior to discharge. | Minor | Minor | No change to the discharge strategy. Mitigation measures outlined in the 2020 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 19 | Benthic Invertebrates | Discharging treated saline effluent into marine environment | Change in benthic invertebrates habitat quality due to the quality of the treated saline effluent discharge from the Meliadine Mine | Discharge of effluent will meet regulatory requirements for both temperature and applicable water quality guidelines.<br>If the treated saline effluent is not suitable for discharge, it will be stored at the Meliadine Mine and treated prior to discharge.<br>Design, construct, and install a diffuser with the discharge pipe to aid in mixing.<br>Monitoring program will be established | Minor | Minor | No change to the discharge strategy. Mitigation measures outlined in the 2020 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 20 | Marine Birds and Marine Mammals | Discharging treated saline effluent into marine environment | Change in fish habitat quality due to the quality of the treated saline effluent discharge from the Meliadine Mine | Adherence to the Ocean Discharge Monitoring Plan.<br>Discharge of effluent will meet regulatory requirements for both temperature and water quality guidelines.<br>If the treated saline effluent is not suitable for discharge, it will be stored at the Meliadine Mine and treated prior to discharge.<br>Design, construct, and install a diffuser with the discharge pipe to aid in mixing.<br>Monitoring program will be established, and adaptive management implemented if negative impacts are detected. | Minor | Minor | No change to the discharge strategy. Mitigation measures outlined in the 2020 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 21 | Marine Birds and Marine Mammals | Discharging treated saline effluent into marine environment | Change in health and survivorship due to the water quality of the groundwater discharge. | Adherence to the Ocean Discharge Monitoring Plan.<br>Discharge of effluent will meet regulatory requirements for both temperature and water quality guidelines.<br>If the treated saline effluent is not suitable for discharge, it will be stored at the Meliadine Mine and treated prior to discharge.<br>Design, construct, and install a diffuser with the discharge pipe to aid in mixing.<br>Monitoring program will be established, and adaptive management implemented if negative impacts are detected. | Minor | Minor | No change to the discharge strategy. Mitigation measures outlined in the 2020 FEIS Addendum will be carried forward through the Meliadine Extension. |
| 22 | Benthic Invertebrates<br>Marine Fish and Fish Habitat<br>Marine birds and Marine Mammals | Discharging treated saline effluent into marine environment | Reduction in sea ice thickness and or timing of seasonal freeze-up could impact marine bird and marine mammal habitat quality. | Discharge water a temperature as close to the natural discharge as practicable.<br>Discharge in the open water month only as per the Adaptive Management Plan. | No linkage | No linkage | No change to the discharge strategy. Mitigation measures outlined in the 2020 FEIS Addendum will be carried forward through the Meliadine Extension. |

**Table B-10: Marine Wildlife - No Linkage and Minor Pathways**

| | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014, 2018, and 2020 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 23 | Marine Birds | Installation of in-water structures (spud barge) and support activities | Sensory disturbance from structural lighting may result in changes in health and mortality risk in marine birds due to collisions with infrastructure | Where feasible, lights on marine infrastructure will be shielded and/or angled to minimize direct illumination and reflection of the sea surface (with the exception of mandatory navigational lighting).<br>Activities will be scheduled during daylight hours whenever practical to minimize the need for staging lights. As most work will occur during summer when daylight is extended, there will be minimal need for site lighting.<br>Vessels will maintain a minimum distance of 200 m from nesting locations in accordance with best management practices for raptor conservation (Demarchi et al. 2005) | Primary | Minor | No change are proposed to marine activities as part of the Meliadine Extension. This effect is considered previously assessed. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 24 | Marine Birds | Installation of in-water structures (spud barge) and support activities | Sensory disturbance from structural lighting and in-air noise from nearshore human activities may alter marine bird behavior | Where feasible, lights on marine infrastructure will be shielded and/or angled to minimize direct illumination and reflection of the sea surface (with the exception of mandatory navigational lighting).<br>Activities will be scheduled during daylight hours whenever practical to minimize the need for staging lights. As most work will occur during summer when daylight is extended, there will be minimal need for site lighting.<br>Vessels will maintain a minimum distance of 200 m from nesting locations in accordance with best management practices for raptor conservation (Demarchi et al. 2005) | Primary | Minor | No change are proposed to marine activities as part of the Meliadine Extension. This effect is considered previously assessed. Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension. |
| 25 | Marine Birds and Marine mammals | Discharging treated saline effluent into marine environment | Accidental release of groundwater from an unknown location along the discharge pipe can have direct adverse effects on marine water quality and associated indirect effects on marine wildlife | Adherence to the Ocean Discharge Monitoring Plan.<br>Implementation of a Risk Management and Emergency Response Plan specific to the potential release of treated groundwater.<br>Operational activities will be engineered to use handling systems to minimize the risk of accidental spills into the marine environment. | Primary | Minor | No change are proposed to marine activities as part of the Meliadine Extension. This effect is considered previously assessed. Mitigation measures outlined in the 2020 FEIS Addendum will be carried forward through the Meliadine Extension. |

**Table B-11: Health of Terrestrial and Aquatic Life - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014, 2018, 2020 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 1 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Rankin Inlet (receiving materials during construction, operations, and closure) | Activities associated with material receipt, storage, and transfer to the Project will result in air emissions, which may cause short-term, localized changes in air concentrations and as a result, soil concentrations, which may affect the health of terrestrial life | Best management practices to control fugitive particulate emissions<br>Exhaust emissions from non-road vehicles will be managed through purchasing equipment that meet Tier 3 emission standards<br>Exhaust emissions from non-road vehicles will be managed through regular and routine maintenance of vehicles<br>SO2 emissions from non-road vehicles and stationary equipment will be reduced through the use of diesel fuel with less than15 ppm of sulphur<br>Best management practices to control fugitive emissions from fuel handling and storage | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 2 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Road footprint during construction, operations, and closure | Project footprint, which will physically alter drainage patterns, may change downstream flows, water levels, and channel/bank stability in streams, and affect water and sediment quality, which may affect the health of terrestrial and aquatic life | Access roads will be as narrow as possible, while maintaining safe construction and operation practice; minimum haul road widths will follow that defined under the Mine Health and Safety Act<br>Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks), where needed<br>Where practical, natural drainage patterns will be used to reduce the use of ditches and diversion berms<br>A Water Management Plan has been developed and describes designs to reduce changes to local flows, drainage patterns, and drainage areas | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 3 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Mine and supporting infrastructure during construction, operations, and closure | Sediment releases from infrastructure and road construction, including watercourse crossings, can affect quality of nearby surface waters and sediments, which may affect the health of terrestrial and aquatic life | Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks), where needed<br>Instream construction work will be avoided, or limited to the minimum extent possible<br>Instream works will be constructed in winter, when possible, to limit increased total suspended solids (TSS) and turbidity, and changes to water and sediment quality<br>Where applicable, construction runoff will be captured and managed to minimize suspended solids<br>Proposed roads will be as narrow as possible, while maintaining safe construction and operating practices | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 4 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Mine and supporting infrastructure during construction and operations | Process and potable water use resulting in reduced water levels can affect water quality in Meliadine Lake, which may affect the health of terrestrial and aquatic life | Manage pumping rates so total annual discharge from Meliadine Lake does not drop below the 10-year dry condition<br>No water withdrawal for filling of pits during the 10-year dry condition<br>Water withdrawal rate(s) will be controlled to reduce effects on Meliadine Lake<br>Capture and reuse site water to reduce fresh water requirements | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>The annual volume of water to be used is the same as that assessed and approved in 2014<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 5 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Site Water Management: seepage and runoff during operations and closure | Runoff and leaching from the waste rock storage facilities and mine footprint may change surface water and sediment quality (i.e., metal concentrations), which may affect the health of terrestrial and aquatic life | A Water Management Plan has been developed and describes the containment and management of contact water on-site<br>Runoff and seepage from the Project site will be diverted to sumps and attenuation ponds (and treated if required) prior to release into Meliadine Lake<br>Water from the attenuation ponds will be used in the process plant<br>Water quality in attenuation ponds will be monitored and managed such that the discharge entering Meliadine Lake meets discharge limits<br>Potential acid generating rock and metal leaching waste rock will be segregated at source and placed into designated areas within waste rock storage facilities | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Monitoring is regularly conducted to identify seepage locations; identified seepage is collected<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 6 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Site Water Management: seepage and runoff during operations and closure | Vertical and lateral seepage from the tailings storage facility may enter nearby waterbodies and change water and sediment quality (i.e., metal concentrations), which may affect the health of terrestrial and aquatic life | A Water Management Plan has been developed and describes the containment and management of contact water on-site<br>Seepage will be captured at sumps and diverted to the tailings storage facility<br>All ponds collecting seepage will be designed to prevent release into the surrounding aquatic environment<br>Tailings storage facility water will be monitored for water quality, and treated as required, prior to discharge | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Monitoring is regularly conducted to identify seepage locations; identified seepage is collected<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 7 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Site Water Management: seepage and runoff during operations and closure | Seepage of pore water though, or underneath, incompletely frozen dikes to adjacent watersheds may change water and sediment quality in local watersheds, which may affect the health of terrestrial and aquatic life | A Water Management Plan has been developed and describes containment and management of contact water on-site<br>The dikes will be designed and constructed to control seepage<br>Performance of the dikes will be monitored, and appropriate remediation applied if required | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Monitoring is regularly conducted to identify seepage locations; identified seepage is collected<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 8 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Construction and operation of roads | Cross-drainage structures for the mine site roads, AWAR, and Rankin Inlet bypass road may alter stream hydraulics and geomorphology, and alter water and sediment quality, which may affect the health of terrestrial and aquatic life | Cross-drainage structures will be designed and constructed such that structures will not create a hydraulic barrier to fish passage and will convey peak flows corresponding to 1:25 year 24-hour rainfall event | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>The AWAR and Bypass road have already been built and are open to the public. The Haul Road from the AWAR to Discovery, has been approved through the Water Licence Amendment.<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward for the site roads required for the Meliadine Extension |

**Table B-11: Health of Terrestrial and Aquatic Life - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014, 2018, 2020 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 9 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Construction and operation of roads | Release of potential acid generating materials from road building materials at the watercourse crossings can alter water and sediment quality, which may affect the health of terrestrial and aquatic life | Use of non-acid generating material at all watercourse crossings; testing will continue on new sources identified for road building<br>Rock quarry activity will be at least 30 m from the high water mark of any waterbody | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>The AWAR and Bypass road have already been built and are open to the public. The Haul Road from the AWAR to Discovery, has been approved through the Water Licence Amendment.<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward for the site roads required for the Meliadine Extension |
| 10 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Construction and operation of roads | Surface water drainage through quarries and transport of blasting residuals and metals directly into watercourses can affect surface water and sediment quality, which may affect the health of terrestrial and aquatic life | Where possible, stockpiling of rock and fill from quarries and borrow sites will be placed such that surface water is not diverted through the piles with runoff to surface waterbodies; drainage from quarries will not flow directly into any waterbodies or watercourses<br>When there is seepage from a quarry or borrow pit that could enter a waterbody, a water quality sample will be collected and analyzed<br>Quarries and borrow pits will be excavated and sloped for positive drainage<br>Quarries and borrow pits will be inspected on a regular basis to monitor water ponding, particularly at spring melt; excavations will be at least 30 m away from any watercourses<br>Best management practices for erosion and sediment control | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward for the Meliadine Extension |
| 11 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Ongoing exploration | Ongoing exploration, and uptake and release of water, can affect surface water and sediment quality, which may affect the health of terrestrial and aquatic life | Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks, timing and location of releases), where needed<br>Best management practices for storage and treatment, if necessary, of any release water<br>Testing, as required by operational licence, before release of water<br>Best management practices for withdrawal rates, withdrawal volumes, and timing of withdrawals<br>Reuse of water, where applicable, to reduce water usage | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 12 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Decommissioning (e.g., roads, buildings, infrastructure, underground workings) during closure | Removal of project infrastructure (e.g., roads, dikes) may change flows and cause release of sediment and contaminants and can affect water and sediment quality, which may affect the health of terrestrial and aquatic life | A Conceptual Closure and Reclamation Plan has been developed and describes measures for permanent closure<br>Best management practices for erosion and sedimentation control, such as installation of rip-rap, if applicable, to prevent erosion after removal of the culverts<br>Instream work will be limited to the minimum extent possible<br>Instream work will follow DFO operational guidance and timing windows<br>All bridges and culverts will be removed and original drainage patterns restored; stream crossings will be rehabilitated<br>Dikes in lakes will be removed to a minimum depth of 1 m below average lake water level or back to original bed; removal of dikes will be timed to minimize release of sediments<br>In the underground workings, seal all drill holes and openings connected to the surface<br>Remove unused explosives and other chemicals from the mine site<br>Roads will be scarified, allowing native plants to re-establish, and slopes will be stabilized against erosion | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Monitoring during decommissioning will be conducted following the approved closure plan<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 13 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Decommissioning of tailings and waste rock storage facilities during closure | Activities required for covering and reclaiming the tailings and waste rock storage facilities may cause release of contaminants and can affect water and sediment quality, which may affect the health of terrestrial and aquatic life | A Conceptual Closure and Reclamation Plan) has been developed and describes measures for permanent closure<br>The waste rock storage facilities have been designed for long-term stability<br>A cover of non-potentially acid generating and non-metal leaching rockfill cover will be placed on the surface of the tailings to a thickness that will allow the tailings to remain permanently frozen<br>The pond in the tailings area will be drained and filled with waste rock to promote surface drainage to Tiriganiaq Pit<br>The surface of the tailings and waste rock storage facilities will be graded to blend into the existing topography and to shed water from the surface | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Monitoring during decommissioning will be conducted following the approved closure plan<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 14 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Remediation of attenuation pond AP-01 during closure<br>(AP-01 renamed to CP1) | Reconnection of attenuation pond (or Lake H17) to Meliadine lake can affect water and sediment quality, which may affect the health of terrestrial and aquatic life | A Conceptual Closure and Reclamation Plan) has been developed and describes measures for permanent closure<br>Sediments will be analyzed, and if concentrations are higher than baseline or guidelines, sediments will be managed according to best practices | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Monitoring during decommissioning will be conducted following the approved closure plan<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 15 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Mine Site (construction) | Construction activities result in air emissions, which may cause short-term changes in air concentrations and, as a result, soil concentrations, which may affect the health of terrestrial life | Best management practices to control fugitive particulate emissions<br>Exhaust emissions from non-road vehicles will be managed through purchasing equipment that meet Tier 3 emission standards<br>Exhaust emissions from non-road vehicles will be managed through regular and routine maintenance of vehicles<br>SO2 emissions from non-road vehicles and stationary equipment will be reduced through the use of diesel fuel with less than15 parts per million (ppm) of sulphur | Minor (bounded by operation effects) | Minor | Construction activities at the windfarm, airstrip and Tiriganiaq-Wolf mining area will temporarily increase the production of fugitive dust and combustion emissions from diesel-powered heavy equipment. However, these emissions are: predicted to be small compared to total emissions from the operational Mine; are temporary (construction phase only) and short in duration; and, of limited spatial extent (e.g., 100's of meters for dust). |

**Table B-11: Health of Terrestrial and Aquatic Life - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014, 2018, 2020 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 16 | Ecological Health (Wildlife and Freshwater Aquatic Life) | AWAR (construction) | Construction activities result in air emissions, which may cause short-term, localized changes in air concentrations, and as a result, soil concentrations, which may affect the health of terrestrial life | Best management practices to control fugitive particulate emissions from construction activities | Minor (bounded by operation effects) | No linkage | AWAR construction effects have already been assessed as part of the 2014 FEIS. No changes proposed as part of Meliadine Extension. |
| 17 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Tailings storage during operations | Wildlife (particularly ungulates) may be attracted to and ingest exposed tailings (this potential pathway was identified as a particular concern by community members during Project consultations ) | A Mine Waste Management Plan has been developed<br>Any potentially acid generating (PAG) or high metal leaching waste rock will be segregated at source and placed into designated areas within the waste rock storage facilities<br>If not suitable for construction, overburden will be stored in the waste rock storage facility<br>Tailings deposition will be designed to limit dust generation | No Linkage | No linkage | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 18 | Ecological Health (Wildlife and Freshwater Aquatic Life) | During construction and operations, air emissions from vehicles | Air emission of sulphur dioxide, nitrogen oxides, and particulates may change water and sediment quality, which may affect the health of terrestrial and aquatic life | Construction equipment, buses, vans, pick-up trucks and transport trucks will be equipped with industry-standard emission control systems<br>Compliance with regulatory emission requirements will be met | No Linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 19 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Construction and operation of camps | The construction and operation of camps may cause erosion and release of substances to surface water and could affect water and sediment quality, which may affect the health of terrestrial and aquatic life | Best management practices for erosion and sedimentation control, and storage and use of chemicals will be implemented<br>Ditches will be constructed to route any runoff water to the attenuation pond<br>Sewage will be directed to the tailings storage facility and will not be released directly to surface water | No Linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 20 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Mine and supporting infrastructure during construction and operations | Spills and leaks during equipment operation can affect water and sediment quality of nearby surface waters, which may affect the health of terrestrial and aquatic life | Hazardous materials and fuel will be stored according to regulatory requirements to protect the environment and workers (i.e., Hazardous Materials Management Plan)<br>Storage tanks (e.g., fuel, engine oil, hydraulic oil, and waste oil and coolant) will be double walled, or located in lined and bermed containment areas<br>Hazardous wastes will be stored on site in appropriate containers and location to prevent exposure until they are shipped off site to an approved facility<br>Individuals working on site and handling hazardous materials will be trained in the Transportation of Dangerous Goods<br>Soils from fuel spill areas will be deposited and spread in a lined landfarm for remediation<br>A Spill Contingency Plan has been developed<br>Emergency spill kits will be available wherever toxic materials or fuel are stored and transferred | No Linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 21 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Pit development and operations | Release of pit water inflows to local watersheds may affect water and sediment quality in local watersheds, which may affect the health of terrestrial and aquatic life | Groundwater inflow to the pits or other dewatered areas will not be directly released to local watersheds<br>All pit water will be pumped to the TSF, re-used in process plant; excess TSF water will be treated, if necessary, prior to release to the receiving environment | No Linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS, 2018 FEIS Addendum, and the 2020 FEIS Addendum<br>Groundwater inflow to the pits is managed through pumping to containment ponds and treatment before discharge to Itivia Harbour<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS, 2018 FEIS Addendum, and the 2020 FEIS Addendum will be carried forward through the Meliadine Extension |
| 22 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Pit development and operations | Removal of bedrock and ore material may change or alter existing faults and change contaminant transport processes in subsurface and surface water quality, which may affect the health of terrestrial and aquatic life | Groundwater model results suggest a travel time of 500 to 1 000 years for water to move, via groundwater pathways, from the tailings storage facility to Meliadine Lake; a talik will have formed beneath the tailings storage facility before water can flow along this pathway | No Linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS<br>The open pits will not intersect the deep groundwater; effects to groundwater baseflows in streams is expected to be negligible.<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 23 | Ecological Health (Wildlife and Freshwater Aquatic Life) | Construction and operation of roads | Freezing and plugging of culverts in the winter may result in over-topping and erosion of road surface releasing silt into watercourses during freshet and affect water and sediment quality, which may affect the health of terrestrial and aquatic life | Use of staggered culvert configuration to promote drainage during spring thaw and freshet<br>Regular inspection of the road to identify any areas where ponding of water along the road represents a risk, and installing additional culverts to alleviate the risk | No Linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS<br>The AWAR and Bypass road have already been built and are open to the public. The Haul Road from the AWAR to Discovery, has been approved through the Water Licence Amendment.<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward for the site roads required for the Meliadine Extension |

**Table B-11: Health of Terrestrial and Aquatic Life - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014, 2018, 2020 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 24 | Ecological Health (Terrestrial Wildlife) | Conveyance of treated groundwater effluent to discharge location via waterlines | Spills or accidental release of treated groundwater effluent from waterline along the AWAR can affect soils quality, vegetation and wildlife. | Adherence to mitigation already in place for the AWAR.<br>Adherence to Spill Contingency Plan.<br>Ready access to an emergency spill clean-up kit for cleaning-up any spills.<br>Delineate extent and volume of spill.<br>Treatment could include vacuum recovery (pending volume and location), and removal of any affected standing water combined with flushing in the summer with fresh water, if required.<br>Hand or mechanical removal of snow impacted by the spill.<br>Containment berms can be used to minimize extent of treated groundwater on the tundra.<br>If necessary, long-term treatments include soil amendments to counteract salinity, fertilization to promote vegetative growth, and natural recolonization.<br>Install a leak detection system.<br>Provide a Toll-free number for the community members to report problem along the waterline<br>Incorporate a leakage detection system on the waterline | Minor | No Linkage | This pathway has been previously assessed through the 2020 FEIS Addendum.<br>There will be no change to the waterline as part of the Meliadine Extension and no change to the assessment results for the Meliadine Extension.<br>Mitigation measures and environmental design features outlined in the 2020 FEIS will be carried forward for the Meliadine Extension |
| 25 | Ecological Health (Marine Aquatic Organisms) | Vessel movements in the proposed shipping corridor and Itivia Bay including near-shore transportation of fuel and dry goods (loading barges, barging, off-loading) | Vessel wakes from nearshore vessels may cause shoreline erosion, which can result in adverse effects to marine water quality with associated indirect effects on marine wildlife. | Vessels in will travel at reduced speeds (≤2 knots). | Minor | Minor | No change to vessel movement activities as part of the Meliadine Extension.<br>Mitigation measures outlined in the Approved FEIS will be carried forward through the Meliadine Extension. |
| 26 | Ecological Health (Marine Aquatic Organisms) | | Propeller wash from nearshore vessels berthing at the spud barge / landing ramp may result in adverse effects to marine water quality, with associated indirect effects on marine wildlife. | Placement of spud barge will avoid sensitive natural habitats. To the extent possible, vessel will shut-down vessel engines and propellers when anchored or tied to the spud barge. | Minor | No Linkage | No change to marine activities as part of the Meliadine Extension.<br>Mitigation measures outlined in the Approved FEIS will be carried forward through the Meliadine Extension. |
| 27 | Ecological Health (Marine Aquatic Organisms) | | Solid waste, grey water, and bilge water discharges from ships may result in direct adverse effects on marine water quality in the proposed shipping corridor and associated indirect effects on marine | Adherence to MARPOL Convention, Protocols and Annexes as set out by the International Maritime Organization (IMO 2008; MARPOL 73/78). Adherence to mitigation outlined in the Shipping Management Plan. | Minor | No Linkage | No change to marine activities as part of the Meliadine Extension.<br>Mitigation measures outlined in the Approved FEIS will be carried forward through the Meliadine Extension. |
| 28 | Ecological Health (Marine Aquatic Organisms) | | Introduction of exotic marine species (including pathogens) from ship ballast water exchange during seasonal shipping events can affect native marine | Adherence to Ballast Water Management Plan (BWMP) as defined in the Shipping Management Plan. Adherence to mitigation outlined in the Shipping Management Plan. | Minor | No Linkage | No change to marine activities as part of the Meliadine Extension.<br>Mitigation measures outlined in the Approved FEIS will be carried forward through the Meliadine Extension. |
| 29 | Ecological Health (Marine Aquatic Organisms) | | Antifouling toxins (e.g., tributyltin) potentially leaching from Approved FEIS and Meliadine Extension vessels can have an effect on the marine environment and bio-accumulation in marine food chains. | Adherence to MARPOL Convention, Protocols and Annexes as set out by the International Maritime Organization (IMO 2008; MARPOL 73/78). Adherence to mitigation outlined in the Shipping Management Plan. | Minor | No Linkage | No change to marine activities as part of the Meliadine Extension.<br>Mitigation measures outlined in the Approved FEIS will be carried forward through the Meliadine Extension. |
| 30 | Ecological Health (Marine Aquatic Organisms) | | Accidental spills of dry cargo (loading and off-loading barges) can have direct adverse effects on marine water quality and associated indirect effects on marine wildlife. | Adherence to Spill Contingency Plan. Adherence to Risk Management and Emergency Response Plan. Adherence to Shipping Management Plan. Adherence to MARPOL Convention, Protocols and Annexes as set out by the International Maritime Organization (IMO 2008; MARPOL 73/78); Canada Shipping Act; and Arctic Waters Pollution Prevention Act. Operational activities have been engineered to use contained handling systems to minimize the risk of accidental spills into the marine environment. | Minor | No Linkage | No change to marine activities as part of the Meliadine Extension. Agnico Eagle has conducted modelling studies indicating that water quality in these areas will not change from background due to the Approved FEIS and Meliadine Extension.<br>The lack of linkage between the Approved FEIS and Meliadine Extension and potential health risks can be traced to multiple lines of evidence: physical barriers between the discharge area and shoreline harvesting areas, quality of the discharge, and size and quality of the receiving environment. In addition, the assumptions applied through the assessment of the Approved FEIS and Meliadine Extension and the modelling results will be validated through monitoring. Consultation activities revealed that the Itivia Harbour is not considered as a primary location of harvesting for mussels and shellfishes by the community.<br>Mitigation measures outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 31 | Ecological Health (Marine Aquatic Organisms) | Installation and presence of discharge pipe | Change in health and survivorship of marine benthic invertebrates due to in-water works and presence of discharge pipe. | Placement of discharge pipe will avoid sensitive natural habitats.<br>Construction and installation of the discharge pipe will adhere to DFO guidance practices of “Measures to Protect Fish and Fish Habitat", and guidance provided in the Erosion and Sediment Control Plan.<br>Best management practices for erosion and sedimentation control will be used to control sediment releases during construction and installation of the discharge pipe and associated structures (e.g., silt curtains, runoff management). | Minor | Minor | No change to marine activities as part of the Meliadine Extension. Discharged water will be rapidly mixed within a few meters of the discharge point; the area of mixed (or unmixed) discharge is very small, and the residence time of any aquatic animal (i.e., fish) passing close to the end of pipe will be very short. Mitigation measures outlined in the FEIS will be carried forward through the Meliadine Extension. |
| 32 | Ecological Health (Marine Aquatic Organisms) | | Change in health and survivorship of marine fish due to in-water works and presence of discharge pipe. | The hierarchy of DFO concepts of “avoid, mitigate and offset” will be implemented as a best practice in reducing risks to aquatic biodiversity.<br>Placement of pipe will avoid sensitive natural habitats.<br>Construction and installation of the discharge pipe will adhere to DFO guidance practices of “Measures to Protect Fish and Fish Habitat" and guidance provided in the Erosion and Sediment Control Plan.<br>Best management practices for erosion and sedimentation control will be used to control sediment releases during construction and installation of the discharge pipe and associated structures (e.g., silt curtains, runoff management). | Minor | Minor | No change to marine activities as part of the Meliadine Extension. to marine activities as part of the Meliadine Extension. Discharged water will be rapidly mixed within a few meters of the discharge point; the area of mixed (or unmixed) discharge is very small, and the residence time of any aquatic animal (i.e., fish) passing close to the end of pipe will be very short. Mitigation measures outlined in the FEIS will be carried forward through the Meliadine Extension. |

**Table B-12: Human Health and Safety - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 1 | Human Health and Safety | Rankin Inlet (receiving materials during construction, operations, and closure) | Activities associated with material receipt, storage and transfer to the Project will result in air emissions, which may cause short-term, localized changes in air concentrations which may directly affect human health<br>Fuel combustion will result in air emissions, which may contribute to territorial and national greenhouse gas emissions, which may directly affect human health<br>Changes in air concentrations may also result in alterations to soil concentrations, which may affect human food and water sources including country foods | Best management practices to control fugitive particulate emissions<br>Exhaust emissions from non-road vehicles will be managed through purchasing equipment that meet Tier 3 emission standards<br>Exhaust emissions from non-road vehicles will be managed through regular and routine maintenance of vehicles<br>SO2 emissions from non-road vehicles and stationary equipment will be reduced through the use of diesel fuel with less than 15 ppm of sulphur.<br>Best management practices to control fugitive emissions from fuel handling and storage | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 2 | Human Health and Safety | Marine Shipping | Marine shipping will results in air emissions, which may contribute to territorial and national greenhouse gas emissions<br>These effect pathways may cause changes to air quality and soil quality (as a result of particulate deposition), resulting in subsequent changes to human food and water sources including country foods | Marine vessels will remain on-station only as long as required for off-loading delivered materials | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 3 | Human Health and Safety | General construction and operation of mine and supporting infrastructure | Spills on the mine site or along the AWAR can cause changes to chemical concentrations in surface water, soil and vegetation, which may affect human food and water sources including country foods | Equipment will be re-fueled, serviced, and washed away from stream crossings and on impermeable pads wherever possible. There will be a wash bay in the maintenance shop<br>Emergency response and spill contingency plans will be developed and implemented | No Linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 4 | Human Health and Safety | Road footprint during construction, operations, and closure | Project footprint, which will physically alter drainage patterns, may change downstream flows, water levels, and channel/bank stability in streams, and affect water and sediment quality, which may affect human food and water sources including country foods | Access roads will be as narrow as possible, while maintaining safe construction and operation practices; minimum haul road widths will follow that defined under the Mine Health and Safety Act<br>Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks), where needed<br>Where practical, natural drainage patterns will be used to reduce the use of ditches and diversion berms<br>A Surface Water Management Plan (SD 2-6) has been developed and describes designs to reduce changes to local flows, drainage patterns, and drainage areas | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 5 | Human Health and Safety | Mine and supporting infrastructure during construction, operations, and closure | Sediment releases from infrastructure and road construction, including watercourse crossings, can affect quality of nearby surface waters and sediments, which may affect human food and water sources including country foods | Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks), where needed<br>Where applicable, construction runoff will be captured and managed to minimize suspended solids<br>Proposed roads will be as narrow as possible, while maintaining safe construction practices | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 6 | Human Health and Safety | Mine and supporting infrastructure during construction and operations | Process and potable water use resulting in reduced water levels can affect water quality in Meliadine Lake, which may affect human food and water sources including country foods | Manage pumping rates so total annual discharge from Meliadine Lake does not drop below the 10-year dry condition<br>No water withdrawal during the 10-year dry condition<br>Water withdrawal rate(s) will be controlled to avoid effects on the source water lake(s)<br>Capture and reuse site water to reduce fresh water requirements | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>The annual volume of water to be used is the same as that assessed and approved in 2014<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 7 | Human Health and Safety | Site Water Management: seepage and runoff during operations and closure | Runoff and leaching from the waste rock storage facilities and mine footprint may change surface water and sediment quality (i.e., metal concentrations), which may affect human food and water sources including country foods | A site Water Management Plan has been developed and describes the containment and management of contact water on-site<br>Runoff and seepage from the Project site will be diverted to sumps and attenuation ponds (and treated if required) prior to release into Meliadine Lake<br>Water quality in attenuation ponds will be monitored and managed such that the discharge entering Meliadine Lake meets discharge limits<br>Potential acid generating (PAG) rock and metal leaching waste rock will be segregated at source and placed into designated areas within waste rock locations | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Monitoring is regularly conducted to identify seepage locations; identified seepage is collected<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 8 | Human Health and Safety | Site Water Management: seepage and runoff during operations and closure | Vertical and lateral seepage from the tailings storage facility may enter nearby waterbodies and change water and sediment quality (i.e., metal concentrations), which may affect human food and water sources including country foods | A site Water Management Plan has been developed and describes the containment and management of contact water on-site<br>Seepage will be captured at sumps and diverted to the tailings storage facility<br>All ponds collecting seepage will be designed to prevent release into the surrounding aquatic environment<br>Tailings facility discharge water will be monitored for water quality, and treated as required, prior to discharge | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Monitoring is regularly conducted to identify seepage locations; identified seepage is collected<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |

**Table B-12: Human Health and Safety - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 9 | Human Health and Safety | Site Water Management: seepage and runoff during operations and closure. | Seepage of pore water though, or underneath, incompletely frozen dikes to adjacent watersheds may change water and sediment quality in local watersheds, which may affect human food and water sources including country foods | A site Water Management Plan has been developed and describes containment and management of contact water on-site<br>The dikes will be designed and constructed to control seepage<br>Performance of the dikes will be monitored and appropriate remediation applied if required | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Monitoring is regularly conducted to identify seepage locations; identified seepage is collected<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 10 | Human Health and Safety | Pit Development | Removal of saline groundwater inflows during pit development to local watersheds may affect water and sediment quality in local watersheds, which may affect human food and water sources including country foods | Water inflow to the dewatered areas will not be directly released to local watersheds; water will be treated and then diverted to a water management pond prior to release into Meliadine Lake | No Linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS, 2018 FEIS Addendum, and the 2020 FEIS Addendum<br>Groundwater inflow to the pits is managed through pumping to containment ponds and treatment before discharge to Itivia Harbour<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS, 2018 FEIS Addendum, and the 2020 FEIS Addendum will be carried forward through the Meliadine Extension |
| 11 | Human Health and Safety | Construction and operation of roads | Cross-drainage structures for the mine site roads, AWAR, and Rankin Inlet bypass road may alter stream hydraulics and geomorphology, and alter water and sediment quality, which may affect human food and water sources including country foods | Cross-drainage structures will be designed and constructed such that structures will not create a hydraulic barrier to fish passage and will convey peak flows | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>The AWAR and Bypass road have already been built and are open to the public. The Haul Road from the AWAR to Discovery, has been approved through the Water Licence Amendment.<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward for the site roads required for the Meliadine Extension |
| 12 | Human Health and Safety | Construction and operation of roads | Release of potential acid generating materials from road building materials at the watercourse crossings can alter water and sediment quality, which may affect human food and water sources including country foods | Use of non-acid generating material at all watercourse crossings. Testing will continue on new sources identified for road building<br>Rock quarry activity will be at least 30 m from the high water mark of any waterbody | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>The AWAR and Bypass road have already been built and are open to the public. The Haul Road from the AWAR to Discovery, has been approved through the Water Licence Amendment.<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward for the site roads required for the Meliadine Extension |
| 13 | Human Health and Safety | Construction and operation of roads | Surface water drainage through quarries and transport of blasting residuals and metals directly into watercourses can affect surface water and sediment quality, which may affect human food and water sources including country foods | Where possible, stockpiling of rock and fill from quarries and borrow sites will be placed such that surface water is not diverted through the piles with runoff to surface waterbodies; drainage from quarries will not flow directly into any waterbodies or watercourses<br>When there is seepage from a quarry that could enter a waterbody, a water quality sample will be collected and analyzed<br>Quarries will be excavated and sloped for positive drainage<br>Quarries will be inspected on a regular basis to monitor water ponding, particularly at spring melt<br>Excavations will be at least 30 m away from any watercourses<br>Best management practices for erosion and sediment control | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward for the Meliadine Extension |
| 14 | Human Health and Safety | Ongoing exploration | Ongoing exploration, and uptake and release of water, can affect surface water and sediment quality, which may affect human food and water sources including country foods | Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks, timing and location of releases), where needed<br>Best management practices for storage and treatment, if necessary, of any release water<br>Testing, as required by operational licence, before release of water<br>Best management practices for withdrawal rates, withdrawal volumes, and timing of withdrawals<br>Reuse of water, where applicable, to reduce water usage | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |

**Table B-12: Human Health and Safety - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 15 | Human Health and Safety | Decommissioning (e.g., roads, buildings, infrastructure, underground workings) during closure | Removal of project infrastructure (e.g., roads, dikes, etc.) may change flows and cause of release sediment and contaminants and can affect water and sediment quality, which may affect human food and water sources including country foods | A preliminary Closure and Reclamation Plan has been developed and describes measures for permanent closure<br>Best management practices for erosion and sedimentation control such as installation of rip-rap, if applicable, to prevent erosion after removal of the culverts<br>Instream work will be limited to the minimum extent possible.<br>Instream work will follow DFO operational guidance and timing windows<br>All bridges and culverts will be removed and original drainage patterns restored. Stream crossings will be rehabilitated<br>Dikes will be removed to a minimum depth of 1 m below average lake water level or back to original; removal of dikes will be timed to minimize release of sediments<br>In the underground workings, seal all drill holes and openings connected to the surface<br>Remove unused explosives and other chemicals from the mine site<br>Roads will be scarified, allowing native plants to re-establish, and slopes will be stabilized against erosion | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Monitoring during decommissioning will be conducted following the approved closure plan<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 16 | Human Health and Safety | Decommissioning of tailings and waste rock storage facilities during closure | Activities required for covering and reclaiming the tailings and waste rock storage facilities may cause release of contaminants and can affect water and sediment quality, which may affect human food and water sources including country foods | A preliminary Closure and Reclamation Plan has been developed and describes measures for permanent closure<br>The waste rock storage facilities have been designed for long-term stability<br>A cover of non-potentially acid generating and non-metal leaching rockfill cover will be placed on the surface of the tailings to a thickness that will allow the tailings to remain frozen<br>The pond in the tailings area will be drained and filled with waste rock to promote surface drainage to Tiriganiaq Pit<br>The surface of the tailings and waste rock storage facilities will be graded to blend into the existing topography and to shed water from the surface | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Monitoring during decommissioning will be conducted following the approved closure plan<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 17 | Human Health and Safety | Remediation of attenuation pond AP-01 during closure | Reconnection of attenuation pond (or Lake H17) to Meliadine lake can affect water and sediment quality, which may affect human food and water sources including country foods | A preliminary Closure and Reclamation Plan has been developed and describes measures for permanent closure<br>Sediments will be analyzed, and if concentrations are higher than baseline or guidelines, sediments will be managed according to best practices | Minor | Minor | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Monitoring during decommissioning will be conducted following the approved closure plan<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 18 | Human Health and Safety | Mine Site (construction) | Construction activities result in air emissions, which may cause short-term changes in air concentrations, which may directly affect human health<br>Fuel combustion will result in air emissions, which may contribute to territorial and national greenhouse gas emissions, which may directly affect human health<br>Short-term changes in air concentrations may also result in alterations to soil concentrations, which may affect human food and water sources including country foods | Best management practices to control fugitive particulate emissions<br>Exhaust emissions from non-road vehicles will be managed through purchasing equipment that meet Tier 3 emission standards<br>Exhaust emissions from non-road vehicles will be managed through regular and routine maintenance of vehicles<br>SO2 emissions from non-road vehicles and stationary equipment will be reduced through the use of diesel fuel with less than 15 ppm of sulphur. | Minor (bounded by operation effects) | Minor | Construction activities at the windfarm, airstrip and Tiriganiaq-Wolf mining area will temporarily increase the production of fugitive dust and combustion emissions from diesel-powered heavy equipment. However, these emissions are: predicted to be small compared to total emissions from the operational Mine; are temporary (construction phase only) and short in duration; and, of limited spatial extent (e.g., 100's of meters for dust). |
| 19 | Human Health and Safety | AWAR (construction) | Construction activities result in air emissions, which may cause short-term, localized changes in air concentrations, and as a result, soil concentrations, which may directly affect human health and their food and water sources including country foods | Best management practices to control fugitive particulate emissions from construction activities | Minor (bounded by operation effects) | No linkage | AWAR construction effects have already been assessed as part of the 2014 FEIS. No changes proposed as part of Meliadine Extension. |
| 20 | Human Health and Safety | General construction and operation of mine and supporting infrastructure | Physical hazards on the mine site would not be expected to change concentrations of chemicals in environmental media and, therefore, not affect human health | Not required for the protection of human health | No linkage | No linkage | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 21 | Human Health and Safety | During construction and operations, air emissions from vehicles | Air emission of sulphur dioxide, nitrogen oxides and particulates may change water and sediment quality, which may affect human food and water sources including country foods | Construction equipment and transport trucks will be equipped with industry-standard emission control systems<br>Compliance with regulatory emission requirements will be met | No linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 22 | Human Health and Safety | Construction and operation of camps | The construction and operation of camps may cause erosion and release of substances to surface water and could affect water and sediment quality, which may affect human food and water sources including country foods | Best management practices for erosion and sedimentation control; and storage and use of chemicals will be implemented<br>Ditches will be constructed to route any runoff water to the attenuation pond<br>Sewage will be directed to the tailings storage facility and will not be released to surface water | No linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |

**Table B-12: Human Health and Safety - No Linkage and Minor Pathways**

| # | Valued Component | Project Phase/Activity | Effect Pathways | Environmental Design Features and Mitigation | Pathway Assessment - 2014 FEIS | Pathway Assessment - Meliadine Extension | Meliadine Extension Rationale |
|---|---|---|---|---|---|---|---|
| 23 | Human Health and Safety | Mine and supporting infrastructure during construction and operations | Spills and leaks during equipment operation can affect water and sediment quality of nearby surface waters, which may affect human food and water sources including country foods | Hazardous materials and fuel will be stored according to regulatory requirements to protect the environment and workers (i.e., Materials and Waste Management Plan)<br>Storage tanks (e.g., fuel, engine oil, hydraulic oil, and waste oil and coolant) will be double walled, or located in lined and bermed containment areas<br>Hazardous wastes will be stored on site in appropriate containers to prevent exposure until they are shipped off site to an approved facility<br>Individuals working on site and handling hazardous materials will be trained in the Transportation of Dangerous Goods<br>Soils from petroleum spill areas will be deposited and spread in a lined landfarm for remediation<br>A Spill Response Plan has been developed<br>Emergency spill kits will be available wherever toxic materials or fuel are stored and transferred | No linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 24 | Human Health and Safety | Pit development and operations | Release of pit water inflows to local watersheds may affect water and sediment quality in local watersheds, which may affect human food and water sources including country foods | Groundwater inflow to the pits or other dewatered areas will not be directly released to local watersheds<br>All pit water will be pumped to the TSF, re-used in process. Excess TSF water will be treated, if necessary, prior to release | No linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS, 2018 FEIS Addendum, and the 2020 FEIS Addendum<br>Groundwater inflow to the pits is managed through pumping to containment ponds and treatment before discharge to Itivia Harbour<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS, 2018 FEIS Addendum, and the 2020 FEIS Addendum will be carried forward through the Meliadine Extension |
| 25 | Human Health and Safety | Pit development and operations | Removal of bedrock and ore material may change or alter existing faults and change contaminant transport processes in subsurface and surface water quality, which may affect human food and water sources including country foods | Groundwater model results suggest a travel time of 500 to 1000 years for water to move, via groundwater pathways, from the tailings storage facility to Meliadine Lake. A talik will have formed beneath the tailings storage facility before water can flow along this pathway | No linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS<br>The open pits will not intersect the deep groundwater; effects to groundwater baseflows in streams is expected to be negligible.<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward through the Meliadine Extension |
| 26 | Human Health and Safety | Construction and operation of roads | Freezing and plugging of culverts in the winter may result in over-topping and erosion of road surface releasing silt into watercourses during freshet and affect water and sediment quality, which may affect human food and water sources including country foods | Use of staggered culvert configuration to promote drainage during spring thaw and freshet<br>Regular inspection of the road to identify any areas where ponding of water along the road represents a risk, and installing additional culverts or French drains to alleviate the risk | No linkage | No Linkage | This pathway has been previously assessed through the 2014 FEIS<br>The AWAR and Bypass road have already been built and are open to the public. The Haul Road from the AWAR to Discovery, has been approved through the Water Licence Amendment.<br>There is no change to the assessment results for the Meliadine Extension<br>Mitigation measures and environmental design features outlined in the 2014 FEIS will be carried forward for the site roads required for the Meliadine Extension |