Environmental Protection Operations Directorate
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ECCC File: 6100 000 012/015
NWB File: 2AM-MEL1631

Karen Kharatyan
A/Manager of Licensing
Nunavut Water Board
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Via email: licensing@nwb-oen.ca

RE: 2AM-MEL1631 – Agnico Eagle Mines Ltd. – Meliadine Project – Saline Pool Final Design and Construction Drawings

Attention: Karen Kharatyan

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Nunavut Water Board regarding the above-mentioned final design and construction drawings. ECCC's specialist advice is provided based on our mandate, in the context of the *Canadian Environmental Protection Act*, the pollution prevention provisions of the *Fisheries Act*, the *Migratory Birds Convention Act,* and the *Species at Risk Act*.

The following comments are provided at this time:

1. Section 5.1 (Design Objectives and Considerations) states that:
   - "*The maximum operating water elevation in the saline water storage/transfer pond is designed to be lower than the minimum operating water elevation in A54 North (or CP5 North) such that the potential risk of saline water seeping out of the pond into the surrounding ground is minimized.*
   - *As requested by Agnico Eagle, the pond is designed to primarily store the saline water in the lower zone below the bedrock surface to minimize the contact between the saline water and the overburden soils.*
   - *The berm is designed to promote permafrost development in the original ground below the center of the berm, which will minimize the potential seepage through its foundation into the pond.*"

Given what the Proponent indicated above, it is likely that the saline water in the pond will negatively affect the ability of the permafrost to prevent seepage by depressing the freezing temperature and or even slow the rate of permafrost accretion. The Proponent should discuss and clarify the potential impact of saline water on the accretion of permafrost.

The Proponent indicates that operating water elevation in the saline water storage/transfer pond is designed to be lower than the minimum operating water elevation in A54 North (or CP5 North) such that the potential risk of saline water seeping out of the pond into the surrounding ground is minimized. The water elevation in the A54 (CP5) is supposed to range from 65.2 to 66.3 m, and the designed maximum operating water elevation in the pond ranges from 62.9m under mean precipitation conditions to 63.4 m under Inflow Design Flood (IDF). Given the proximity (approximately 20m judging from Figure 2 and its scale) of the CP5 to the saline pond berm, the Proponent should clarify how the difference in water elevation between the two facilities would prevent seepage between them.

2. Section 5.9 (Seepage Evaluation) states that:
   "*Thermal analyses have indicated that the overburden and bedrock below the center of the berm will become frozen after one winter following berm construction and remain frozen for the zone with an elevation below approximately 65.9 m. Therefore, the seepage through the frozen berm foundation would be limited if the water elevation outside of the berm is lower than 65.9 m.*"

   Figure A33 shows the thermal profile of GT09-21 in APPENDIX A: BOREHOLE LOGS OF GT09-21 AND MEASURED GROUND TEMPERTURES (GOLDER, 2010). There are two profiles taken at 08-Sep-09 7:10 and 08-Sep-09 22:00 that show higher temperatures in the double digits from top to bottom. Although borehole GT09-21 is some distance away from the saline pond and its protective berm, it is assumed that the ground condition in the borehole area also applies to the ground conditions in and around the saline pond. The Proponent should clarify what the two temperature profiles represent given the above statement from Section 5.9.

Should you require further information, please do not hesitate to contact me at (867) 669-4733 or Melissa.Pinto@canada.ca.

Sincerely,

Melissa Pinto

Melissa Pinto
Environmental Assessment Coordinator

cc: Georgina Williston, Head, Environmental Assessment North (NT and NU)
ECCC Review Team