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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

File No: **2AM-MEL1631/TR/D1, D2**

September 9, 2020

Sara Savoie
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RE: Design Report for the Saline Effluent Treatment Plant Upgrade; Type "A" Water Licence No: 2AM-MEL1631, Meliadine Gold Project, Agnico Eagle Mines Limited

Dear Ms. Savoie:

The Nunavut Water Board (NWB or Board) has completed its technical review of the construction design report entitled *"Design Report, Saline Effluent Treatment Plant (SETP) Upgrade"*, dated May 2020 (Design Report), provided to the Board on June 19, 2020 by Agnico Eagle Mines Limited (Agnico Eagle) to fulfill the requirements of Part D, Item 1 of Water Licence No: 2AM-MEL1631 (Licence).

This submission included the final design and construction drawings for the Saline Effluent Treatment Plant (SETP) upgrade, as well as the associated Operation & Maintenance Manual (OMM), which was updated to reflect the changes related to the upgrade. In its submission, Agnico Eagle stated that *no additional building or infrastructure will be added to the existing facilities constructed in 2019*, since the planned upgrades will be completed within the original building. As a reminder, the purpose of the SETP is to treat the saline water coming from the underground mine and stored in the surface Saline Ponds 1 (SP1) and 4 (SP4). *The effluent from the SETP will be pumped to SP3, after which it will be transported by tanker truck to Melvin Bay where it will be discharged via an underwater pipe diffuser.*

Upon receipt, the submission was distributed for a three (3) week public review with a deadline for comments set at July 10, 2020. All correspondence relevant to this submission is available from the NWB's ftp site using the following link:

ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-MEL1631%20Agnico/3%20TECH/D%20CONSTRUCTION/SETP%20Upgrade/

On July 9, 2020, the Environment and Climate Change Canada (ECCC) provided their comments recommending the following:

- to include passing the marine invertebrate test using *Acartia tonsa* as a treatment target for non-acute lethality;
- to specify the targets for TDS and ammonia; and
- to provide information on how Agnico Eagle will achieve TDS reductions in the effluent.

On July 10, 2020, Crown-Indigenous Relations and Northern Affairs (CIRNA) provided their comments recommending the following:

- to revise the pH range from between 6 and 9 to between 7.0 and 9.0; and
- to include the methodology and the design of effluent TDS treatment in the design report.

On July 15, 2020, Agnico Eagle provided the following responses to the interveners' comments:

- Committed to plan for inclusion of the *Acartia tonsa* test when this requirement comes into force in June 2021;
- Clarified that the maximum operational target for TDS will be 39 600 mg/L as established in Golder (2019);
- Clarified that the maximum operational target for ammonium concentration will be derived from the MDMER limit based on un-ionized ammonia at 0.5 mg/L for the Maximum Authorized Monthly Mean Concentration and 1.0 mg/L for the Maximum Authorized Concentration in a Grab Sample;
- Clarified that the TDS reduction will be achieved using the same approach as described in the approved SETP Design Report from 2019 and provided a conceptual flowsheet of the SETP, including the TDS adjustment reactor;
- Committed to respecting MDMER for the pH of the treated water between 6 and 9 and noted that the impact of having a pH below 7 will have a very low impact on the marine environment; and
- Clarified what the key changes in the SETP would be compared to 2019:
  - Improve TSS removal by retrofitted the Multiflo unit (classical lamella clarifier) to an Actiflo unit (sand ballasted lamella clarifier);
  - Increase in capacity for breakpoint chlorination (improve ammonia removal);
  - Additional granular activated carbon (GAC) filters for higher dechlorination;
  - Supplemental reagent dosing capacity and control for improved treatment performance; and
  - Upgrade of pumping capacity to manage a higher throughput to meet the approved target of 1,600 m^3/d discharge to sea.

In correspondence dated July 16, 2020, the ECCC indicated that Agnico Eagle's response pertaining to TDS reduction in the effluent did not fully address their comment and requested further clarification. On July 20, 2020, CIRNA also requested further clarification on their comment on the effluent TDS treatment, as well as the statement that the lower pH will not have a significant negative impact on the marine ecosystem.

On July 31, 2020, Agnico Eagle submitted their responses to the interveners' follow-up comments and included the updated Design Report accounting for these responses. In their

submission, Agnico Eagle clarified that *the treatment described in the design report is primarily related to ammonia treatment* and further continued that *various contact water sources at site – including Underground and Surface Contact Water – are combined, at times, to minimize overall site footprint and to support long term environmental management at site*, and that *the strategy of TDS attenuation will be the primary process for managing TDS concentrations*. In other words, Agnico Eagle intends, when necessary, to reduce the TDS of saline groundwater by dilution with treated surface contact water from CP1 only, rather than treatment via a TDS adjustment reactor. With respect to CIRNA's comment regarding the pH, Agnico Eagle stated that they *commit to respect the regulation for the water quality discharge to the sea, which is the MDMER. The MDMER regulation request that the pH of the effluent is equal to or greater than 6.0 but is not greater than 9.5.*

In correspondence dated August 13, 2020, the ECCC indicated that they had a meeting with Agnico Eagle, where *the Proponent has agreed to provide an amended process flow diagram and water balance flow diagram, accompanied by text clarifying the inputs to the SETP for treatment of contact water from non-saline sources.*

On August 14, 2020, CIRNA confirmed that they had no further comments with respect to their pH question, but reminded Agnico Eagle that *Amendment #1 of NIRB Project Certificate #006 authorizes the discharge of only saline effluent (salty or saline groundwater) from the Tiriganiaq Underground Mine into the marine environment at Melvin Bay near Rankin Inlet* and *does not appear to include any surface water in the effluent.* Therefore, *appropriate approvals from other authorities and regulatory agencies would be required, should the proposed approach for saline effluent TDS reduction fall outside of the scope of the approved project.*

On August 31, 2020, Agnico Eagle submitted the revised Design Report and noted that the revised flowsheet requested by the ECCC, which was discussed with the ECCC on August 27, 2020, was included into this submission. Additionally, Agnico Eagle clarified that *it is Agnico Eagle Mines Limited's view that the SETP Upgrade Design Report is still within the scope of the approved project.*

On September 8, 2020, both CIRNA and the ECCC confirmed that they have no further comments regarding the SETP Design Report.

By copy of this letter the Board acknowledges that the construction design report entitled *"Design Report, Saline Effluent Treatment Plant (SETP) Upgrade", Revision 2,* dated August 28, 2020, addresses the requirements of Part D, Item 2 of Water Licence No: 2AM-MEL1631, and has approved this Design Report through the Board Motion No. 2020-A1-006, dated September 09, 2020, as required by Part D, Item 1 of the Licence. Additionally, the NWB acknowledges that the Operation & Maintenance Manual for Saline Effluent Treatment Plant has been reviewed and accepted by the Board.

The Licensee is advised that the Board's "approval" of this document is a verification that the proposed activities are consistent with the existing terms and conditions of the Licence, and more specifically with Part D, Item 2, and may proceed in accordance with the Report and drawings

provided. It should be noted that the Board's "approval" is NOT intended or offered as any representation regarding the suitability of the plans nor third party verification of the design, construction, planning or engineering discussed in the documents.

Should you have any questions, please feel free to contact the undersigned at (867) 360-6338 (extension 29) or sergey.kuflevskiy@nwb-oen.ca, at your earliest convenience.

Sincerely,

Sergey Kuflevskiy
Technical Advisor
NUNAVUT WATER BOARD

Cc: Distribution List – Meliadine