



July 31st, 2020

Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU
X0B 1J0

Subject: Comments on 2AM-MEL1631 Design Report for Saline Effluent Treatment Plant (SETP) Upgrade and Operation & Maintenance Manual

Dear Mr. Dwyer,

Please find attached Agnico Eagle Mines Limited (Agnico Eagle)'s response to Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) and Environment and Climate Change Canada (ECCC)'s follow-up comments on the Design Report for the Saline Effluent Treatment Plant (SETP) Upgrade and Operation & Maintenance Manual..

Agnico Eagle is submitting a revised Design Report for the Saline Effluent Treatment Plant (SETP) Upgrade reflecting these responses and remains available to further discuss if required.

Kind regards,

A handwritten signature in blue ink, appearing to read "T. Ternes".

Terry Ternes
General Supervisor, Environment
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Comment 1 ECCC: TDS Attenuation

Environment Climate Change Canada (ECCC) has reviewed the responses provided by Agnico Eagle Mines Ltd. (AEM) related to the design report for saline effluent treatment plant (SETP) upgrades according to our mandate. ECCC notes that AEM's response has not fully addressed our comments. ECCC requested AEM provide information on how they will achieve total dissolved solids (TDS) reductions in the effluent. In their response, AEM stated:

"The TDS reduction will be achieved as presented in section 3.6 of the report. (6526-680-132-REP-001)"

The process flow diagram was referenced in the response but provides no further details. ECCC acknowledges that the purpose of the design document is to describe upgrades to the SETP, but as TDS levels in effluent may be affected by the volume increases associated with the upgrade, this question is relevant to the document under review.

Agnico Eagle Answer:

The treatment described in the design report is primarily related to ammonia treatment. Also, for clarification, 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. The strategy of TDS attenuation will be the primary process for managing TDS concentrations. The reference to the "reactor" in the SETP design report has been updated to reflect this clarification.



CIRNAC: Treatment Objectives of SETP: pH

In its original submission, CIRNAC recommended that the effluent treatment objective for pH be revised from between 6 and 9 to between 7.0 and 9.0, unless it can be demonstrated that the lower pH will not have a significant negative impact on the marine ecosystem.

AEM stated in its response that “... the Modelling Assessment of Groundwater Discharge into the Melvin Bay Marine Environment, Rev B (Appendix D of the approved SETP Design Report 6528-680-132-REP-001, Golder 2019) show that the mixing at the discharge location is high and parameters such as TDS and chloride concentrations, reach the baseline concentration +10% within a few meters distance from the diffuser. Therefore, we expect that the impact of having a pH below 7 will have a very low impact on the marine environment” and that “The pH behaviour in the mixing zone will be further characterized this discharge season during the sampling that will occur in the receiving environment as per the MDMER.”

Although AEM has predicted that concentrations of conservative parameters such as TDS and chloride would be close to baseline values (i.e., $\pm 10\%$) within a few meters from the diffuser, pH is not a conservative parameter and may behave differently. In the above-quoted AEM response, it is not clear if AEM is implying that proton concentration will be within 10% of the baseline value only a few meters from the diffuser and therefore, the impact of discharging effluent with a pH below 7 will be very low on the marine environment. It is also not clear if AEM is committed to sample the mixing zone during discharge season to confirm its predictions on the parameters, including proton concentrations. CIRNAC requests further clarification from AEM on this issue.

Agnico Eagle Answer:

Agnico Eagle commits 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.



Comment 2 CIRNAC: Treatment Objectives of SETP - Total Dissolved Solids

In its original submission, CIRNAC noted the absence of the methodology and the design of effluent TDS treatment in the design report and recommended that such information be included.

AEM responded that *"The TDS reduction will be achieved as presented in section 3.6 of the report. (6526-680-132-REP-001), which follows the same approach as described in the approved SETP Design Report from 2019."*

Section 3.6 of the report is reproduced below in its entirety:

"3.6 PH AND TDS ADJUSTMENT REACTOR

Treated waters (both from SETP GAC filters and Actiflo) and treated CP1 contact water flow into the pH and TDS adjustment reactor where pH and TDS are adjusted. Sulfuric acid will be used for pH adjustment in this reactor."

CIRNAC does not find this response adequate in addressing CIRNAC comment on effluent TDS treatment.

Agnico Eagle Answer:

The treatment described in the design report is primarily related to ammonia treatment. Also, for clarification, 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. The strategy of TDS attenuation will be the primary process for managing TDS concentrations.