Indigenous and Northern Affairs Canada | Affaires autochtones et du Nord Canada

Water Resources Division
Nunavut Regional Office
Iqaluit, NU X0A 0H0

Your file - Votre référence
2AM-BOS---- & 2AM-DOH1323

June 1, 2018

Our file - Notre référence
CIDM#1220863

Richard Dwyer
Manager of Licensing
Nunavut Water Board
Gjoa Haven, NU X0B 1J0

Re: Indigenous and Northern Affairs Canada's reply to TMAC Resources Inc.'s response to our recommendation #14 for their water licence applications 2AM-BOS---- and 2AM-DOH1323 amendment #2 for phase 2 of the Hope Bay Project

Dear Mr. Dwyer,

During the technical meeting for the above mentioned applications, Indigenous and Northern Affairs Canada (INAC) made a commitment to confirm whether we were in agreement with TMAC Resources Inc.'s (TMAC) response to our technical recommendation #14.

The comment we had made pertained to long term climate change effects, specifically how climate change impacts past 2100: *Would the thickness of the active zone increase further? At what depth would the active zone become stable? Would this affect the overall environmental performance of the site?* The recommendation is:

> *TMAC should perform sensitivity analyses that projects climate change effects to 200 years post closure using the predicted climate data for 2100. The sensitivity analyses should assess any incremental environmental impacts that might occur (e.g., additional seepage from tailings). The findings of the sensitivity analyses should be considered when developing the next revisions of the Closure and Reclamation Plans.*

TMAC's April 4, 2018 written response to this comment is:

> *TMAC disagrees that additional climate change sensitivity analysis is required. TMAC's approach to climate change is clearly documented in Package P5-1 – Climate Change Analysis Approach Report, Hope Bay Project. This approach is explicit, transparent and intentionally does not*

make predictions based on opinions or personal preferences with regard to approach, methodology, period or choice of climatic models. Suggesting sensitivity analysis beyond the year 2100, goes against current acceptable practice insofar as use of climate change models, as recognized and supported by Environment and Climate Change Canada (ECCC).

Furthermore, while climate change does play a role in predicted post-closure water quality predictions, the most significant driver is the actual tailings source terms which have been rigorously and conservatively calculated as defined in Package P5-9 (Source Terms Predictions for the Proposed Madrid North, Madrid South, and Boston Deposits, Hope Bay Project). As more information of these source terms becomes available through project development, water quality predictions will be updated and that would provide much greater certainty regarding future conditions than academically speculating about climate change.

During discussion in Cambridge Bay, TMAC explained that if they extended the permafrost thermal modelling past 2100 using the 2100 climate model weather prediction, the active layer thickness would remain unchanged.

Upon further review, INAC now understands that the simplifications used in the thermal model, specifically the constant flux lower boundary condition, would not allow heat to accumulate in the model between years if the forcing function is unchanged.

INAC is satisfied with the responses at this stage. We agree that further work will be required on geochemical source terms once data from project development is available, and will be reviewing how it is integrated into the closure and reclamation plan.

Please do not hesitate to contact me at 867-975-3876 or sarah.forte@canada.ca for any additional information.

Regards,

Sarah Forté
Water Management Specialist