Environment Canada Environnement Canada

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Dec. 10, 2009 Our File: 4703 001 015 110

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

Attention: Richard Dwyer By email

Re: Agnico-Eagle Mines Ltd. - Meadowbank Gold Mine – 2AM-MEA0815 – Review of Updated Water Management Plan (WPM) and the Mine Waste Management Plan (MWMP)

The above plans have been reviewed by Environment Canada (EC) staff, and the following comments are offered for your consideration. Environment Canada's contribution to your request for specialist advice is based primarily on EC's mandated responsibilities under Section 36(3) of the *Fisheries Act* and the *Canadian Environmental Protection Act*.

Overall, the Plans are well laid out and provide a good level of detail, along with excellent figures. The licence requirements are substantially covered, with some gaps as identified below. Section F.16 of the water licence states that:

> *The Licensee shall submit to the Board for approval, within six (6) months of Licence approval, a revised Mine Waste and Water Management Plan to include:*
> *a. Detailed Ammonia Management Plan;*
> *b. Integration of the Waste and Water Management Plan submitted under Water Licence 8BC-TEH0809, Part D. Item 1;*
> *c. Field testing program for closure cover depth of the Taillings Storage Facility and Waste Rock Storage Facilities with consideration for climate change; and*
> *d. A protocol for distinguishing Seepage through facilities.*

Ammonia Management Plan

In the Water Management Plan (WMP), ammonia and nitrate are mentioned in that, "explosive use will need to be carefully dosed to avoid ammonia and nitrate loading to site drainage waters in both Portage and Vault areas." However, other than this mention there is no detailed ammonia management plan included in the water or the waste management plans. EC requests that this be provided, and asks that it include current calculations of the loss rate based on experience to date.

Plan Integration

The Plan submitted under Water Licence 8BC-TEH0809 refers primarily to construction details and pre-site management, so most of it would not need to be integrated into the new plan. However there is a section that refers to road and quarry maintenance, and

this has not been addressed by the updated plan. There is a section on haul roads in the MWMP (section 4.5.3 pg 4-8) but there is no discussion on quarry areas.

Closure Cover Field Testing
The plan does not outline a specific field testing program, as required in F.16.c. The plan states that cover trials will be completed during operation to confirm the required cover thickness to physically isolate the tailings and confine the active layer within relatively inert materials; however, there is no mention of how the field testing program will be conducted.

Seepage
Item F.16.d. is not explicitly addressed, although seepage as a general category is discussed with respect to monitoring and management.

Updated Water Management Plan
Section 3.1
TSS is referenced for the dewatering criteria; turbidity should be noted as this seemed to be the limiting parameter for discharges.

Section 3.1.2
Table 3.3 notes a final elevation of the tailings of 144.9 m with 30% ice entrapment. At the bottom of the same page (3-26) addition of the lake-bottom sediments is shown as a percentage of the capacity at elevation 148 m. Is the additional 3.1 meters in elevation a "worst-case" estimate for maximum ice and sediments? It is not clear what the elevation of 148 m represents.

Section 4.3
How will seepage in the collection ditches be tracked? Permafrost will be used down-gradient of the water control structures – will embankments be instrumented to monitor that freezing conditions occur?

Section 4.4.3
The second sentence of the second-last paragraph is unclear: "The Reclaim Pond will receive little site contact water, and will therefore not have minimal attenuation function."

Section 4.5.2
The possibility of using Phaser Lake is mentioned as an alternative attenuation storage pond (the paragraph is carried forward from the 2007 version of the plan). It is my understanding that Phaser Lake is fish-bearing, and the use of this lake was not contemplated in the Environmental Assessment, nor in the regulatory processes.

Section 6.2 Water Balance Model Results
The figures showing the site water balance show decant volumes directed to Third Portage Lake (Figures 6.2 to 6.5) and Wally Lake (Figures 6.9 to 6.11) from minewater and runoff collected in the Tailings Impoundment Area. The first such discharge occurred in 2009, and would continue until pit flooding for the Portage site, and for the first several years of operations at the Vault pit.

Recent discussions with the mine staff had indicated that the need to discharge to Third Portage Lake could (would) be deferred for several years at least, and perhaps until pit flooding commenced. Clarification is requested as to whether discharge to the receiving

environment is planned or not. The text in Section 6.3 mentions the TSF capacity to store all excess water, but does not specify that this will be the case.

Updated water quality predictions have been provided, and it should be noted that all predictions are for the dissolved form of metals rather than the total form. The predictions section should specify what concentration of total suspended solids is predicted (worst case would be the water licence limits of 15 mg/L) and an estimate of the metals concentrations which could be associated with particulates. The predicted concentrations in the "Probably" scenario are generally below licence levels for the attenuation ponds, but mercury would be one example where the contributions of particulate-associated mercury would potentially put concentrations above the licence criteria in the Portage Attenuation Pond. This would be more of a concern if the predictions for the "Possible Poor End" scenario are realized.

Inclusion of the long term pit lake water quality line for both sites was useful. The document did not specify whether the predicted concentrations for Portage are based on a fully mixed pit, or whether there would be a chemocline separating an upper better-quality layer of water overlying a denser layer with higher concentrations of major ions and metals.

Mine Waste Management Plan

One of the concerns EC raised in the course of the water licence hearings was the documentation of effective rock segregation practices; the waste management plan should reference the updated Operational ARD-ML Sampling and Testing Plan (2008) as submitted for licence Part I.4.

Please do not hesitate to contact me at (867) 669-4735 with any questions or comments regarding the foregoing.

Yours truly,

Anne Wilson
Water Pollution Specialist

cc: Carey Ogilvie (Head, EA-North, EPOD)
Glenn Groskopf (Mining Specialist, EPOD, Regina)
Carrie Spavor (Environmental Assessment Coordinator, EPOD, Iqaluit)