



Environment Canada
Environnement Canada

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Our File: 4703 001 015 040 020

Jan. 8, 2010

Richard Dwyer
Licensing Administrator
Nunavut Water Board
P.O. Box 119
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By email

**Re: Meadowbank Gold Mine - Water Quality Monitoring and Management Plan
for Dike Construction and Dewatering – Water Licence 2AM-MEA0815 Part
D.11**

On behalf of Environment Canada (EC) I have reviewed the information submitted in connection with the above-noted water licence submission, and provide the following comments for your consideration. In support of the plan review, a teleconference was held Nov. 12th between EC and Stéphane Robert of Agnico-Eagle Mines Ltd. (AEM), with meeting notes circulated to the Board on Nov. 13, 2009. The following specialist advice has been provided pursuant to Environment Canada's mandated responsibilities under the *Canadian Environmental Protection Act*, and Section 36(3) of the *Fisheries Act*.

Comments and Recommendations:

Section 4.1.4.1 Winter causeway construction

EC concurs with the proposal to construct a causeway over the winter within the dike footprint, in order to mitigate against suspended solids by reducing wind and current energy. The main concern is that we do not feel it has been conclusively demonstrated by the previous under-ice rock placement in Portage Arm impoundment area that construction can be done with minimal increases in suspended solids from the rock fines and from bottom disturbance. The emplacement rate and techniques proposed will need to be carefully adjusted in response to monitoring results, as there is no ability to contain suspended sediments under ice, and work will be done during the period of development for over-wintering fish eggs.

Given the timing of overwintering eggs it would be appropriate to use the licence limit for after Sept. 1st with the Short Term Maximum of 25 mg/L, at least in the vicinity of spawning areas (EC defers to the Department of Fisheries and Oceans for extent, duration and other related aspects).

Section 4.2.1 Figure 7

Monitoring during causeway construction is proposed to be done from 50-100 m out, depending on ice safety, from fixed sampling stations as shown in Figure 7 of the plan. To provide more relevant data for construction decision-making, EC recommends that monitoring be done from "moving" stations around the deposition area, noting that the fixed stations would be too far away in many cases. Water clarity measurements could be done on a daily basis (ongoing as needed) to inform the rock placement rate and evaluate the effects of rock deposition. Measurements could be done at one hole drilled up to 100 m out in the direction of increasing water depth, and additional holes could be drilled to delineate TSS movement if appreciable levels are measured.

Section 4.1.1.2 Open water construction

The area between the curtains is extensive but allows for the deployment of the turbidity curtains in shallower depths. If there is elevated turbidity between the two curtains the deeper basin (106 m elevation) may focus any sediments that escape the inner curtain, and biota in this area may be affected. Will post-construction monitoring be done to evaluate effects?

Section 4.2.2 Monitoring during open water

Given the wide area enclosed by the outer curtain, including the depositional area within the 106 m depth contour line, it is unlikely that anything escaping the inner curtain would travel upslope along the bottom (noting that previous turbidity plumes occurred at depth) and it would be expected that the two eastern sampling stations and the north-east station shown on Figure 8 should remain close to background. Accordingly, averaging in these readings would understate impacts and potentially delay action in the event high turbidity was seen at the four stations to the west, in the area of high value fish habitat. To avoid this, EC recommends that the four highest results from all stations (profile maxima) be averaged to compare to licence limits and thresholds for action.

The plan states that not all stations will be monitored each time (page 14, bullet 2), and EC recommends that some further rationale be outlined in the plan for when stations would or would not be sampled.

Section 5.1.2 Dewatering

Bullet 9 seems to be misplaced in the dewatering section, and would belong in the dike construction section. Given the licence limits at end of pipe for dewatering, there should be no likelihood of a sediment plume occurring in connection with dewatering discharges.

Figure 10

Change "all stations" to "4 highest stations" in three boxes for 24 hour, 7 day, and 30 day averages.

Figure 12

The first "no" should go to arrow on left.

General:

EC recommends that the plan include a quality control/quality assurance (QA/QC) section for turbidity measurements. This could include the calibration of field turbidity with lab TSS results, which should be confirmed for each new site.

Please do not hesitate to contact me at 867-669-4735 or by email at

anne.wilson@ec.gc.ca with any questions or comments regarding the foregoing.

Sincerely,

Anne Wilson
Water Pollution Specialist
Environmental Assessment - North

cc. Carey Ogilvie (Head, EA-North, Yellowknife)
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