



March 16, 2007

Zabey Nevitt
Executive Director
Wek'èezhii Land and Water Board
C/o Mackenzie Valley Land and Water Board
Box 2130
Yellowknife, NT
X1A 2P6

Re: EMAB final comments on DDMI Aquatic Effects Monitoring Program – February 2007

Dear Mr. Nevitt,

Thank you for the opportunity to provide final comments on the document titled *Diavik Diamond Mine Aquatic Effects Monitoring Program: AEMP Design Document 2007* (draft AEMP) submitted February 16, 2007 by Diavik Diamond Mines Inc's (DDMI), at the direction of the Wek'èezhii Land and Water Board (WLWB). The Environmental Monitoring Advisory Board (EMAB) also wishes to thank the WLWB for inviting us to participate in the AEMP Technical Workshop March 7-9, 2007. We also wish to commend DDMI for organizing the preparatory workshop for community participants immediately before the WLWB workshop.

Issue - Next Steps

EMAB found the workshop to be a valuable forum for seeking clarification and clearing up some misunderstandings regarding the draft AEMP as well as for raising issues regarding some components and discussing the way forward toward a revised draft AEMP. We found excellent value-added in the interaction between DDMI representatives/consultants, representatives of parties, and the facilitators. We were largely pleased with the verbal clarifications and commitments provided by DDMI. In general the workshop reinforced our conviction that the draft AEMP is on the right track and that DDMI intentions will result in an AEMP that meets the objectives set out for it. Significant revisions and additions will need to be made to the draft AEMP in order to address the questions and issues raised.

The most significant and overarching issue we believe faces the WLWB at this point is the next step in the approval process for the draft AEMP.

Rationale - there is considerable value in having the winter 2007 sampling season take place using the sample design proposed by DDMI in the draft AEMP, with appropriate modifications as proposed by reviewers. Not only will the data collected be useful, but DDMI has stated these data will provide substantial information on the characteristics of the reference sites and that this information is needed before summer monitoring. DDMI also indicated they need more information at the edges of the plume, and the proposed addition of mid-field sites NE of MF2-4 and particularly NW of MF1-3 will provide a better idea of its extent, and the suitability of the reference sites. Further, DDMI acknowledged that the EEM program would have five FF sites per spoke, although the proposed program has four. DDMI stated during the workshop that the sampling program will be subject to adaptive management in the initial stages and that there may be changes throughout the program, so it is important to move forward as quickly as reasonable with sampling. In order for winter sampling to proceed the WLWB has indicated the draft AEMP must be approved by March.

EMAB also believes there is considerable value in having DDMI submit a revised draft AEMP for review and comment by the parties before the WLWB makes decisions regarding its approval. In particular we see value in a review of revisions in the areas of: incorporation of Traditional Knowledge, measurement endpoints, effects sizes and levels, decision rules for determination of effect ie. caused by Diavik, integration of results, and the linkage between effects levels and the decision-making framework. The revised version should also include the areas DDMI committed to address in its responses: increasing the number of mid-field and far-field stations to five for each “spoke”, rationale for rejection of zoobenthos, evaluation of all options for monitoring phytoplankton/periphyton and analysis of community composition of plankton collected under the draft AEMP before analyzing older collections.

Resolution - As discussed at the workshop, it seems reasonable to EMAB for the WLWB to give direction to DDMI to proceed with winter sampling using the sampling design proposed in the draft AEMP as adjusted to reflect input from the parties, while also directing DDMI to revise the draft AEMP following the verbal clarifications and commitments made during the workshop and any additional direction from the WLWB. We would welcome the opportunity to comment on the revised version.

Issue - Interpretation of inconsistencies

Rationale - The draft AEMP was prepared by 12 authors, with an additional nine contributors and three reviewers. As would be expected with so many people involved in preparing such a large document over such a short period of time, linkages between some components are not always completely transparent and there are some inconsistencies. We encourage the WLWB to provide for this in any direction it gives or any interpretation required later.

Resolution - In general we would expect that where there is an inconsistency, the provision that would provide more information, more powerful data, greater environmental protection etc. would apply.

Detailed comments

As stated in our initial comments on the draft AEMP, DDMI has done an impressive amount of work in preparing this document. To introduce our comments we note that EMAB members and our technical consultants were challenged by the volume of information provided (over 500 pages plus almost 200 pages of technical appendices). In order to attempt to meet the schedule set by the WLWB with the resources available we had to restrict our review to sections 4, 5 & 6 of the draft AEMP and this letter comprises EMAB's comments. EMAB has also attached final technical comments on sections 4, 5 & 6 prepared by our expert contractor, North-South Consultants as well as our own more detailed comments on the study design.

Where feasible we have tried to follow the WLWB's requested format for concerns: issue, rationale, resolution. In some cases the rationale for our comments is contained in the attached North-South review.

Issue - Study design

Resolution - The relationship between measurement endpoints identified in Table 4.3-8, the guidelines and effects sizes in Table 4.3-9, decision rules as to what constitutes an effect, the additional lines of evidence used to assess changes including the analytical techniques ("tools in the toolbox") and the decision-making framework in Figure 4.3-11 requires further clarification (Appendix 1). Integration of all results related to aquatic effects, including Special Effects Studies and Fisheries Authorizations studies, needs to be addressed in greater detail.

Issue - Cumulative effects assessment

Resolution - DDMI should explain how it will test its prediction, made in the environmental assessment, that there will be no cumulative effects with the Ekati mine and that cumulative effects associated with the winter road will be of low magnitude, local extent and mid-term duration and that the overall cumulative effect of the winter road on aquatic life would be a Level I Local Effect?

Issue - QA/QC

Resolution - DDMI has said it will develop this plan after approval of the AEMP. It should be available for review by parties, perhaps as part of the proposed phased approval process.

Issue - Special effects studies

Resolution - Methods and results of some of these studies have been critiqued by North-South and by the Department of Fisheries and Oceans (DFO). DFO has rejected some of these studies as not meeting the requirements of the Fisheries Authorization. DDMI should acknowledge these concerns and indicate how they have been, or will be, dealt with.

Issue - Dust monitoring

Rationale - EMAB submitted expert comments by SENES Consultants on DDMI's dust monitoring to DDMI. These comments were also included as part of our evidence at the water licence renewal hearing. These comments state that non-standard methods are being used without having been verified against standard methods rendering the data potentially unreliable. DDMI has not addressed any of these comments in its submission. DDMI stated at the workshop that they would provide a report from their air quality monitoring expert showing that the methodology and data are acceptable before the end of this review period. Unfortunately this report has not been provided at the time of writing.

Another participant pointed out that the data do not show confidence intervals and that there appears to be variability that is not being captured. He suggested that more sites are needed, possibly including an additional transect, and that better analytical methods exist for the data.

SENES also noted that DDMI does not monitor other air emissions that could fall out onto Lac de Gras. EMAB understands that DDMI is working with Environment Canada and Environment and Natural Resources to develop a comprehensive air quality monitoring program. When this program is in place, the AEMP should be reviewed, and revised as appropriate, to include any relevant information.

Resolution - DDMI must address these concerns in its revised draft of the AEMP.

Issue – Integration of results

Resolution - The draft AEMP should provide a detailed description of how multiple lines of evidence will be integrated (see also comments on study design). The decision-making framework should include this.

Issue - Traditional Knowledge

Rationale - Section 4.4.1 on Traditional Knowledge (TK) indicates that it will be up to Aboriginal communities to determine, in consultation with DDMI, how to conduct the monitoring (p. 412) and further states that it will support the design of additional aquatic monitoring programs. This section is well-intentioned but appears to put the onus for conducting the work on the communities and fails to provide concrete information on how DDMI would facilitate incorporation of TK into the AEMP as directed by the ToR eg. a consultation plan and schedule, workshop format etc.. EMAB was pleased that DDMI stated at the workshop that it would provide funds to involve communities in monitoring.

Community participants also recommended DDMI hire a TK manager as part of its Environment Department, that monitoring involving Aboriginal people be hands on, involving hunters and trappers, and that reporting of monitoring results to communities is needed.

DDMI references the Comprehensive Study Report (CSR) as documenting the public consultation process and TK studies that guided the development of the monitoring programs, however none of the examples presented relate directly to monitoring of aquatic quality and EMAB has not found any such examples in the CSR. Clarification is required here or DDMI should acknowledge that direct community input to aquatic monitoring has been lacking.

Resolution - DDMI should provide the missing details listed above. For clarification, DDMI must take the lead in working with communities; EMAB is prepared to act as a resource in such a process, but DDMI's commitment in the EA is directly between it and the communities. For example, one Party to the EA stated they have been waiting to assist DDMI to ensure TK is integrated into the AEMP. They also stated that people are constantly watching their environment and see any changes as they happen.

Issue - Adaptive Management Plan

Rationale - Many of the discussions at the workshop regarding follow up when a change is detected are based on expectation of an Adaptive Management Plan (AMP). DDMI states that the AEMP is a primary component of an adaptive management approach.

Resolution - DDMI should provide additional detail on their overall adaptive management approach as it links to the draft AEMP through the decision framework, including whether it proposes to develop an AMP that plugs into the decision framework. While such a plan is beyond the scope of the current water licence, the WLWB should be made aware of this consideration.

Issue - Reporting

Rationale - The question of integration of multiple lines of evidence in assessing and reporting results has not been addressed at a level that allows reviewers to provide input. Community participants noted at the workshop that a plain language version of the AEMP was helpful and that monitoring results need to be reported to communities.

Resolution - DDMI should address both these elements of reporting in the revised AEMP.

Issue - Environmental Agreement commitments

EMAB was pleased that the WLWB acknowledged the commitments DDMI made through the EA in its January 22, 2007 directive. EMAB had hoped that DDMI would describe how the draft AEMP meets each of its commitments in the text, or through a conformity table such as they used to show how the ToR were met. EMAB continues to encourage DDMI to do this.

EMAB again acknowledges that DDMI organized a two-day preparatory workshop for two participants from each of the Aboriginal Parties to the EA to build their capacity to participate effectively in the WLWB Technical Workshop. This workshop was intended

to assist in meeting DDMI's commitment to make best efforts to involve Aboriginal People in the design of its monitoring programs.

Issue - Meaningful and effective participation

Rationale - The Environmental Monitoring Advisory Board (EMAB) was formed through the commitment of all Parties to the Environmental Agreement for the Diavik Diamond Mine (EA). EMAB's mandate includes provision of a meaningful role for each of the Aboriginal Peoples in the review and implementation of environmental monitoring plans.

We observe that there was general consensus at the workshop that the WLWB schedule did not allow sufficient time for DDMI to prepare a comprehensive draft AEMP or for reviewers to prepare detailed reviews. Capacity issues for review were raised by Parties to the Environmental Agreement. In a number of instances DDMI experts noted that information was missing from the draft AEMP because they simply didn't have the time to include it, or to ensure that the final product was internally consistent.

EMAB continues to be concerned that a number of the Aboriginal Parties to the Environmental Agreement (EA) have not been able to, and will not be able to participate meaningfully and effectively in this process due to lack of resources (such as access to funds to contract technical expertise), and because of the demanding review schedule.

Resolution - While there is little that can be done at this point in the process, it is hoped that if revisions to the AEMP are required in future, a longer period will be provided both for DDMI to make revisions and for reviewers to examine them. EMAB made recommendations regarding provision of funding for full and effective participation of Aboriginal Parties in such proceedings in its intervention to the recent hearing.

Thank you again for the opportunity to comment. Please contact John McCullum at the EMAB office if you require further information.

Sincerely

Doug Crossley
Chair

Cc EMAB members (by email)
Parties to the Environmental Agreement

Appendix 1 - EMAB comments on study design

1. The study design determines effects by making spatial comparisons between exposure and reference areas (p. 401); however a number of the comparisons identified in the draft AEMP are temporal, and it is noted that a temporal trend “does not necessarily indicate an adverse effect.” **The effects sizes should explicitly describe any temporal comparisons made at each level. For transparency the measurement endpoints in Table 4.3-9 should explicitly state each comparison of each measurement endpoint presented in Table 4.3-8 so that the linkage is clear** eg. in Table 4.3-8 one BIC measurement endpoint is comparison of total benthic invertebrate density and densities of dominant invertebrate groups to reference conditions but Table 4.3-9 simply states statistical difference in the near-field relative to reference areas.
2. The workshop included a great deal of discussion about the adequacy of measurement endpoints and a number of alternatives were proposed for specific instances. There was a lot of discussion about benchmarks and it was noted that CCME has a non-degradation policy meaning that background levels should be used to set benchmarks, where possible. It was also noted that DDMI’s power analysis applied only to benchmark parameters and that it would do power analysis on each benchmark to ensure a sufficient number of sample sites. **DDMI should revisit the guidelines and effects sized and revise them as necessary.**
3. A number of decision rules, are placed on determination of whether effects on BICs are mine-related (eg. p. 453). DDMI acknowledged that some of the rules were too restrictive and needed to be changed while also stating they would be preparing such rules for the other AEMP components. **Any decision rules that will be applied in determination of effects for any components should include detailed explanation/justification and should be scientifically defensible.** Similarly, there was frequent reference to additional lines of evidence to be used in assessing effects, additional “tools” for analyzing data, and additional data that may be collected or studies done to determine whether/how an effect has occurred. **All of these should be explicitly presented and described, along with a description of how, and in what circumstances, they will be used.** For example DDMI indicated at the workshop that if sediment chemistry changed they might use bioassay or bioaccumulation tests.
4. While Figure 4.3-11 appears to indicate that an early warning will trigger an evaluation of the study design and annual monitoring, the text of 4.3.8.4 states that an early warning will not automatically trigger management actions. A number of statements were made about this framework during the workshop. The draft AEMP states that if effects are caused by mine operations, an early warning effect will result in continuation of the monitoring cycle eg. three yearly, and that more frequent monitoring will only be triggered by a moderate or high level effect. At the workshop DDMI experts indicated that where early warning levels were reached they would examine the change to see what is occurring and that the study design would be evaluated to determine whether it is effective to answer such a question; however this is not captured in the framework. It was also indicated at the workshop that DDMI would consider modifying the decision-making framework to include a step within the AEMP where the cause of an effect would be identified, and which might trigger more frequent monitoring. DDMI also agreed to explicitly state that the “evaluate study design” box would

- include ensuring that a Type 2 error rate of 10% is met. **EMAB would welcome these changes.**
5. In 4.3.8.4 describing triggers of management action, it appears that the draft AEMP is stating it will determine whether effects are effluent-related rather than project-related.
 6. The decision-making framework (figure 4.3-11) indicates that determination of the cause of an effect is outside the AEMP, as is the adaptive management plan that would determine the response(s). **As discussed in 3. above, identification of the cause of a change should be part of the AEMP. The decision-making framework should include more detail to distinguish between identification of cause in the AEMP as a means of evaluating and revising monitoring and identification of cause for the purpose of determining management actions.**