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February 13, 2007

David Scott
Manager, Business Development
BHP Billiton Diamonds Inc.
#1102 4920-52 Street
Yellowknife, NT X1A 3T1

Dear Mr. Scott,

Re: EKATI Diamond Mine CALPUFF Air Dispersion Modelling Assessment

This is a joint review of the EKATI modelling report by the Government of the Northwest Territories, Department of Environment and Natural Resources (ENR) and Environment Canada. The objectives of the modelling project were to estimate current ambient air quality and atmospheric deposition levels at the EKATI diamond mine and to assist in designing a monitoring program. We feel that this report satisfies these objectives and we look forward to discussing this report and moving forward with designing a monitoring program with BHP Billiton.

In general, Rescan has provided a quality report and the modelling methodology and results appear to be reasonable, although all model input and output files should be provide in a usable format to complete the review (see bullet 6 below). In addition, some of the conclusions are not supported by the data presented in the report and are discussed below. There are also a few issues in the report for which we request further clarity.

Points for Clarity:

- In Appendix E: Response to EC/GNWT Reviewer Comments, Rescan responds to the EC/GNWT question regarding sulphur content in diesel fuels by citing the MDA 2002 report – “ According to MDA 2002 the diesel used at Ekati has a sulphur content of 0.095% by weight.”. It would provide comfort to the reviewers if BHP Billiton would directly confirm that this sulphur content is correct.
- In Appendix C, NOx emissions from the Ekati power plant (57.04 g/s) are 60% less than NOx emissions from the Diavik diesel generators (133.5 g/s). However SO2 emissions from the Ekati power plant (1.64 g/s) are 25% greater than SO2

emissions from the Diavik diesel generators (1.25 g/s). Please explain the apparent discrepancies between the Ekati and Diavik emissions.

- Has EKATI collected dustfall measurements that could be compared to the model results?
- Deposition plots for TSP, sulphate and nitrate, figures 3.2-3 to 3.2-8, have been provided for winter (October 1 to June 1) and summer (June 2 to September 30) periods. The units given for the plots (kg/ha/yr) are incorrect since neither the winter or summer periods extend for an entire year. The seasonal plots are useful but a combine annual plot for each species is needed for a complete assessment. Please provide annual deposition plots for TSP, sulphate and nitrate.
- Are the ambient concentration plots and the potential acid input (PAI) plot based on annual results or on seasonal results?
- The input files provided in Appendix B and Appendix F are useful but to complete a thorough review we require all model input and output files. Please provide all of the input and output files for the CALMET and CALPUFF models in a format that can be used directly in the models.

Comments on the report's conclusions:

The conclusions tend to downplay impacts from mine emissions particularly for the deposition results. We do not contend that the mine emissions are having a significant impact, however, the conclusion that mine emissions are negligible compared to background levels is not supported by the data supplied in the report.

- Conclusion 3, Sulphate Deposition: Rescan states that “within 3 to 5 km of the mine the deposition is predicted to be indistinguishable from background rates”. The background deposition rate for sulphate is given as 1.1 kg/ha/yr. The model results for the winter period, provided in figure 3.2-5, indicate that the 1.5 kg/ha/yr isopleth extends beyond 10km. If the deposition from winter period were combined with the summer results the elevated levels of sulphate deposition would extend even further. Since the 1.1 kg/ha/yr isopleth, representing background levels, is not provided in the plots, it is not possible to determine the full spatial extend of elevated sulphate levels due to mine emissions. The snow core data, provided in figure 3.2-2a and 3.2-2b are inconclusive because only distance from the source is included and not other influencing variables such as wind direction. That said, there does appear to be a decreasing trend with distance and the most distant measurements are above background levels.
- Conclusion 4, Nitrate Deposition: Similar to Conclusion 3, Rescan states that “the mining operations contribution to nitrate deposition were negligible beyond 5 to 10 km from the active mining areas”. The background deposition rate for nitrate is given as 1 kg/ha/yr. The model results for the winter period, provided in figure 3.2-7, indicate that the 1.5 kg/ha/yr isopleth extends beyond 20km and beyond the mine claim boundary. If the deposition from winter period were combined with the summer results the elevated levels of nitrate deposition would extend even further. Since the 1 kg/ha/yr isopleth, representing background levels, is not provided in the plots, it is not possible to determine the full spatial extend of the

elevated nitrate levels due to mine emissions. The snow core data, provided in figure 3.2-2a and 3.2-2b, indicate that most of the samples were below background levels. This is surprising considering the large NO_x emissions at the mine site. Rescan discusses the problem of nitrate stability and potential loss of mass through evaporation on page 3-6. ENR has also cited this concern in its July 23, 2003 review letter to BHP Billiton of the *EKATI Diamond Mine Air Quality Monitoring Report, 2001*. Until this issue is better understood the nitrate deposition data from snow cores should be considered unreliable.

The model results indicate that there is potential that mine emissions may cause exceedances of the SO₂, NO₂, TSP, PM₁₀ and PM_{2.5} ambient air quality standards. This supports the need for an improved ambient air quality monitoring program.

We commend BHP Billiton for completing this modelling project and look forward to participating in the planned revisions of the EKATI Air Quality Management Plan and the Air Quality Monitoring Program as expressed in your letter dated October 30, 2006 to Mr. Robert Overvold, Regional Director General, INAC and Mr. Robert Bailey, Deputy Minister, ENR.

Sincerely,

Graham Veale
Air Quality Programs Coordinator
Environment and Natural Resources

Dave Fox
Air Pollution Management Analyst
Environment Canada

cc. Brent Murphy (BHP Billiton)
Anne Wilson (Environment Canada)
Gavin More (Government of the Northwest Territories)
Kevin O'Reilly (Independent Environmental Monitoring Agency)
Lionel Marcinkoski (INAC)