Independent Environmental Monitoring Agency
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July 2, 2003

Ian Goodwin
Manager
Environment, Community and External Affairs
BHP Billiton Diamonds Inc.
#1102 4920-52nd Street
Yellowknife, NT X1A 3T1

Dear Mr. Goodwin,

Re: Recommendations for the Air Quality Management and Monitoring Plan 2003

The Independent Environmental Monitoring Agency has reviewed the *Air Quality Monitoring Report* from 2001 and the *Air Quality Management and Monitoring Plan for 2003*. Further to our initial letter to you of May 14, 2003 the Agency has discussed some, but not all, of the main issues with BHPB Environment staff. Our primary concerns continue to focus on the reported elevated levels of total suspended particulates and deposition of dust around Ekati.

The Agency acknowledges the importance of focusing on priority issues at the site. We support monitoring activities that confirm whether the environment and human health are protected and, if necessary, lead to improvements in environmental management practices. With this in mind the Agency respectfully submits the following comments and recommendations.

Your report concludes that the monitoring data are of excellent quality, and that ambient air quality objectives are being met based on snowpack data and the dispersion modelling conducted in 1995. The Agency has reason to question these findings, based on our independent review. The deficiencies in the air quality assessment mean that it alone is not sufficient to determine whether ambient air quality objectives are being met, even if the existing monitoring program is delivering reliable information on which to make this determination. To help resolve the deficiencies, we recommend that new air dispersion modelling analysis be conducted, to be used as the basis for future air quality monitoring work, including the siting of sampling stations.

In preparation for the next large sampling season in 2004 we recommend the following activities for improving BHPB's air quality program:

1) Conduct new air dispersion modelling using updated data on emissions, adjusting the boundary of mining activities to a more ecologically appropriate zone, and employing a more recent dispersion model that can incorporate particulate deposition. A more detailed description of our comments and recommendations is included as an appendix.
2) Based on the modelling predictions, determine the necessary revisions to the existing monitoring program.
3) Re-site the High Volume Air Samplers, and possibly increase the stations, based on the revised monitoring program.

The Agency recommends that BHPB, in consultation with ourselves, Environment Canada and Resources, Wildlife and Economic Development, review the air quality modelling and monitoring programs in preparation for the 2004 sampling season.

We look forward to working with you on this important issue.

Sincerely,

-ORIGINAL SIGNED BY-

Red Pedersen
Chairperson

Cc: Environment Canada, RWED, DIAND, MVLWB, Society Members

Appendix: IEMA Comments on Air Quality Monitoring Programs at Ekati
July 2, 2003

Dust

BHPB's claim that blasting activity appears to have no significant effect on measured dust levels and that, instead, dust levels actually decrease during blasting periods, is not supported. Our review found that neither information nor analysis was provided to show the location of the two sampling stations in relation to mining activity and to prevailing winds at the time blasting occurred. Without knowing which way the wind was blowing at the time of each blast, and with only two monitors installed, it is impossible to determine what effect blasting activity has had on dust levels in the vicinity of the mine, or with distance downwind from the mine.

In addition, since blasting lasts for a short period, the dispersal of the plume would take less than hour and, as a result, the 24-hour average particulate concentration would hardly be affected in any event. If only a portion of the plume passed over the monitors, the levels would be much lower than if the centreline of the plume did. And if plumes were carried off in any direction other than directly toward the two monitors, then dust levels would look similar on days with and without blasting. Consequently, in addition to good wind data, many more monitoring locations would also be required to ensure that there was a reasonable probability of intercepting the plume from an explosive blast.

As for the conclusion that dust levels are higher on days without blasting than on days with blasting, and that these differences are due to decreased traffic activity between blasts, the BHPB report provides no information to show that traffic and other activity levels are substantially decreased in the intervening intervals between blasts. While traffic activity may decrease just before and just after a blast, there is no evidence that the total daily activity levels on days with blasting are any different from days without blasting.

Similarly, critical data for wind speeds and precipitation levels on the days when air sampling was carried out was not provided in the BHPB study. It is well established that airborne particulate levels increase with increasing wind speeds, and decrease on days with significant levels of precipitation. The result is that the study's conclusions have been formed in the absence of critical data, and have not considered the effect of wind speed, direction, location of the monitors, and precipitation.

Our review found that the only demonstrable conclusion that can be drawn from the data is that overall levels of measured particulate matter in the air have steadily increased from year-to-year at both monitoring locations.

Meeting Air Quality Objectives

Our review also found that the BHPB report's conclusion that annual air quality objectives are being met at the mineral claim boundary, as supported by the snow chemistry data, is flawed. BHPB conducted dust sampling only during the warmer

months from mid-May to late September, and it is not possible to determine that annual average ambient air quality objectives have been met if data have not been collected for eight months of the year.

The BHPB report does note that the highest suspended particulate levels were recorded at the monitor located on top of the accommodation building, but then dismisses these readings as anomalous because of interference from the cleaning of kitchen ducts and ventilators located in the immediate vicinity of the monitor. Contamination by kitchen emissions aside, our view is that none of the data from this monitor can be considered useable, since its placement violates commonly recognized guidelines for the siting of such samplers.

The location of the only other monitor, Grizzly Lake, in relation to the mineral claim boundaries is not provided in BHPB's report. Furthermore, while the report states that wind speed and direction were considered in the interpretation effort, no information is provided on the location of the Grizzly monitor relative to the mine site and prevailing winds. Consequently, it is not possible to determine how relevant Grizzly Lake air monitoring data are to identifying the impacts of mining on ambient levels of suspended particulates.

This negates the use of actual monitoring data to determine how dust is dispersing on the property. The result is that BHPB's conclusion about the attainment of air quality objectives rests entirely upon the 1995 EIS modelling and the snow chemistry data. Both of these approaches have problems.

First, the 1995 air dispersion model did not have a plume depletion and deposition sub-model for determining how dust would behave, and thus would have been incapable of accurately modelling dust emissions since it could not account for the reduction of dust levels due to deposition as the plume moves outward.

Second, we cannot corroborate the 1995 model with assumptions about mining operations and emissions since the needed information is not provided in the BHPB report. If current emissions are substantially different from those which were assumed in 1995, the dispersion modelling must be redone to more accurately reflect current conditions.

Third, snow chemistry data reflect the impact of dust deposition, not ambient particulate concentrations. As coarse particles settle out first as distance from the source activity increases, the snow survey data will not provide a direct measure of suspended particulate levels with distance from the mine. A large number of monitors would have to be located at increasing distances from the mine in order to show a correlation between seasonally averaged dust levels and seasonal snow chemistry.

A bigger concern exists because the current dust monitoring is conducted during the warm summer months, and the snow chemistry data reflects dust concentrations in the cold season. Conditions for dust dispersion are unlikely to be the same in the winter and

summer seasons, and so no conclusions can be drawn about the attainment of air quality objectives based on snow chemistry alone.

Our review concludes that there is currently insufficient information to reach a determination about whether current operations at Ekati meet the air quality objectives at the mineral claim boundaries.

In addition, we do not support the use of the mineral claim boundaries for determining environmental effects from the mine's airborne emissions. The property is many times larger than the actual mine footprint, and vegetation, water and wildlife could be affected by airborne contamination well within the property limits. In our view BHPB should give serious consideration to refining the boundaries of where guidelines are to be met to a more realistic zone of influence around the mine footprint.

Lastly, BHPB's report from 2001 concludes that non-aerosol associated chemicals such as NO_3 and SO_4 are distributed at least 20 km and that more assessment must be done to determine the influence of long range transport of atmospheric pollutants. As well, the report indicates the need for more distant control sites. The proposed program for 2003 and 2004 does not include any reference as to how the monitoring program will be adjusted to address these recommendations.