



Snap Lake Environmental Monitoring Agency
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John Bartlett
Environmental Superintendent
De Beers Canada Inc.
Suite 300-5102 50th Ave.
Yellowknife, NT
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December 22, 2008

Subject: Comments on De Beers 2007 Submissions

Dear Mr. Bartlett,

On behalf of the Snap Lake Environmental Monitoring Agency (SLEMA), thank you for the De Beers Responses to SLEMA 2006 Annual Reporting Reviews. SLEMA acknowledges the efforts De Beers has made and looks forward to the ongoing effective communication with De Beers.

The following documents have been reviewed by SLEMA:

- Air Quality and Emissions Monitoring and Management Plan (August 2008),
- Hydrology Monitoring Program (April 2008),
- Quality Assurance and Quality Control (QA/QC) Plan (Revision 2008),
- 2007 Acid/Alkaline Rock Drainage (ARD) and Geochemistry Monitoring Report,
- Streamflow and Lake Elevation Monitoring Program 2007 Annual Report (September 2008),
- 2008 Annual Geotechnical Inspection of Water Management Pond Dams (August 2008), and
- Preliminary Investigation of the Distribution of treated Sewage Effluent in 'Wetlands A' (December 2007).

SLEMA is generally satisfied with the information provided, and comments are provided one by one in the subsequent sections.

1. Air Quality and Emissions Monitoring and Management Plan (August 2008)

General Comments

- The document presents necessary information for air quality and emissions monitoring and management.

Comments on Chapters



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- Section 1.5, p6 (Table 1-1): The table is missing a NWT 24-Hour standard for PM_{2.5} (30 µg/m³).
- Section 2.1, p 9 (Figure 2-1): Is “Turbine” in Legend referring to Incinerator in the map?
- Section 2.2.4, p 10: Snowfall is an important parameter for Hydrology Monitoring Program (see comments on Hydrology Monitoring Program dated September 11, 2008). It is strongly recommended that De Beers add total precipitation into the parameter list and resume the monitoring of snowfall on site.
- Section 2.5.1, p16: “Figure 2-2” in line 3 seems to be a typo. It should be Figure 2-1.
- Section 2.5.5, p17: It is stated that results from “five passive stations” will be analyzed. This is inconsistent with Figure 2-1, in which six passive stations (SO₂ / NO₂ Passive 002, 004, 006, 007, 010, and 011) are showed. Clarification is requested.
- Section 2.3 and 2.5: It is recommended that De Beers provide a summary of monitoring equipment, especially for particulate matter (such as specifications and applicability), SO₂ and NO₂ and explain how to improve data recovery rate in cold weather.
- Section 3.1, p 20 (paragraph 2): The three main components mentioned should be of the Emission Monitoring Program, instead of AQEMMP.
- Section 3.2.1.6, p27: There is a typo in the conversion equation for PM₁₀.

2. Hydrology Monitoring Program (April 2008)

General Comments

- The document presents necessary information for hydrological monitoring program.

Comments on Chapters

- Section 2.2.1, p11: It is stated that “there is insufficient runoff for channelized flow to develop” in the northwest peninsula of Snap Lake, and as a result, “there are few natural locations on the northwest peninsula where runoff volumes could be reliably measure”. The measurement of snowfall and rainfall may help estimate the site runoff volumes, and further improve the quality of water balance analysis in the annual reports. However, the snowfall monitoring is missing in Section 2.3 Hydro-Meteorological Monitoring (see the next comment).
- Section 2.3.3, p14: In the list of hydro-meteorological monitoring parameters, there is rainfall only, instead of total precipitation (rain and snow). De Beers did install a Yankee Environmental Systems TPS 3100 Total Precipitation Sensor in 2005. Due to periodical malfunction of the



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sensor, there has not been enough valid data to present in the 2006 annual reports of both Air Quality and Emissions Monitoring and Management Plan (AQEMMP) and Hydrology Monitoring Program. It is strongly recommended that De Beers add total precipitation into the parameter list and resume the monitoring of snowfall on site.

- Section 2.3.1, Figure 2-2 (p15): The figure is titled “2006 current Air Quality and Meteorological Monitoring Stations”. It is out of date and should be updated.
- Section 2.3.4, p16: Water temperature and water level are included in the parameter list of hydro-meteorological monitoring. Are they measured in the hydro-meteorological monitoring station, or in other stations? Clarification is requested.

3. Quality Assurance and Quality Control (QA/QC) Plan (Revision 2008)

There are a few typos:

- Page ii: first line of the Table of Contents, and
- Page 12: “Appendix III and V” in Section 4.2, “Appendix VI and VII” in Section 4.3, and “Table 2” in Section 4.4 seem to be typos.

4. 2007 Acid/Alkaline Rock Drainage (ARD) and Geochemistry Monitoring Report

From the report, acid rock drainage might not be an intermediate concern rather than the elevated concentrations of nitrate and ammonia of runoff near the explosive storage facility.

In the sub-sections such as 5.3.5.5, which are related to the explosive storage facility, it is stated that “placement of the sodium nitrate storage bags near the edge of the (explosive) storage pad resulted in the seepage of sodium nitrate down the rocket pad embankment” in 2006 and 2007. However, the monitoring data show the elevated concentrations of nitrate and ammonia, rather than sodium. That might be typos, but clarification is requested.

The following table summarizes the number of occurrences of concentrations of either ammonia-N or nitrate-N in SNP 02-07.2, SNP 02-07.3 and SNP 02-09 exceeding the discharge criteria in SNP 02-17 (20 mg/L for ammonia-N or 56 mg/L for nitrate-N, any grab samples) from 2006 to 2008.

Year	June	July	August
2006	1		
2007	3	18	10
2008			1



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The berms were constructed and the impermeable membrane was raised in 2007 to provide containment of runoff from the explosive pad. The remediation activities significantly reduced the number of exceedance (from 31 in 2007 to 1 in 2008). The permanent solution for explosive storage in 2009 might completely solve the problem of runoff from the explosive pad having elevated concentrations of nitrate and ammonia.

In addition to the explosive storage facility, bog water in the west end of the airstrip was reported to contain elevated concentrations of nitrate and ammonia. It was said to be "consistent with a lingering influence from localized blasting and construction that took place in 2006". If the trend of elevated concentrations of nitrate and ammonia stands, De Beers should take mitigative measures to reduce the impacts on the environment.

5. Streamflow and Lake Elevation Monitoring Program 2007 Annual Report (September 2008)

General Comments

The submission only fulfills part of the Water Licence requirements for Hydrology Monitoring, because it only provides one of the three components in the Hydrology Monitoring Program.

The submission reported lake water level of 444.147 meters above sea level (masl) in average, which is inconsistent with the number in 2007 Water Licence Annual Report (444.176 masl). Clarification is requested.

The runoff, groundwater recharge, and the net evaporation are important for water balance analysis. Site runoff and hydro-meteorological data could not be presented in the submission due to lack of runoff on site and equipment malfunction in 2006. As a result, the estimations for both uncontained site runoff and net precipitation were from EAR in 2002, and the same as those in 2005. The estimation of groundwater recharge is also questionable. It is recommended that De Beers improve associated monitoring programs and enhance the water balance analysis.

6. 2008 Annual Geotechnical Inspection of Water Management Pond Dams (August 2008).

No comments.



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7. Preliminary Investigation of the Distribution of treated Sewage Effluent in 'Wetlands A' (December 2007)

There are two typos in the Executive Summary. The investigation took place in 2007 rather than 2006.

SLEMA supports the recommendation that annual monitoring of the flows and conductivity within wetlands during the spring freshet should occur if non-compliant treated sewage effluent continue to be discharged into 'Wetlands A'.

SLEMA would be pleased to discuss the above comments with De Beers and others to ensure improved environmental management and reporting.

During the second half of the year, SLEMA noticed some evidence of De Beers improvements, and the examples include but are not limited to:

- Data representation in SNP monthly reporting – the water quality compliance in SNP 02-16i and SNP 02-17 has been shown in charts since August, and
- Calibration of monitoring equipment – the INAC inspector confirmed in his October report that the issues associated with ensuring that the meters in the water treatment plant are properly calibrated (i.e., providing accurate readings) had largely been resolved.

In addition, SLEMA is happy with De Beers initiatives to reduce environmental impacts, such as:

- Efficient energy building design for the permanent accommodation building and with less footprint than replaced temporary construction camp, and
- Wind testing tower with an intention to reduce diesel use and associated air pollutant emissions.

SLEMA encourages De Beers to continue its efforts in environmental improvements.

Sincerely,

Original signed by

Johnny Weyallon
Chairperson