



January 2013 Environmental Update for SLEMA Board

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January 31, 2013

Outline

1. Mine Update
2. Inspection Update
3. Regulators' Update
4. Aboriginal Update
5. Stakeholders' Update
6. Agency's Activities
7. SLEMA Reviews



Acronyms

- AANDC – Aboriginal Affairs and Northern Development Canada (previous INAC – India and Northern Affairs Canada)
- AEMP – Aquatic Effects Monitoring Program
- ARD – Acid Rock Drainage
- DFO – Fisheries and Oceans Canada
- EC – Environment Canada
- ENR – Department of Environment and Natural Resources, GNWT
- GNWT – Government of the Northwest Territories
- MVLWB – Mackenzie Valley Land and Water Board
- PK – Processed Kimberlite
- SLEMA – Snap Lake Environmental Monitoring Agency
- SNP – Surveillance Network Program
- TDS – Total Dissolved Solids
- WEMP – Wildlife Effects Monitoring Program
- WTP – Water Treatment Plant
- WMP – Water Management Pond



1.1 Mine Update – December 2012

- Production rate: 92.3% of its capacity (90,163 tonnes of kimberlite processed)
- 3,156 m³ of water withdrawn from Snap Lake
- 968,072 m³ of treated water discharged into Snap Lake
- 78,019 tonnes of coarse reject and 63,413 m³ of slimes deposited in the North Pile
- 5 spills (3 reportable)
- Water sampled in 7 monitoring stations
 - The monthly average for all parameters met compliance
- Construction Activities
 - Construction of the East Cell and deposition of PK grits for the rib-berms continued in the East Cell. A new landfill was established in Cell 1 of the East Cell
 - A \$5.8 million upgrade to the pump and piping infrastructure managing water from the perimeter sumps to the WMP is underway



1.2 Spill Reporting in January 2013

Date	Location	Waste Spilled	Amount (L)	Cause
January 11	Winter road portage to the mine site	Hydraulic oil	151	Ice or rock snagging the hydraulic hose of the Komatsu 250 loader
January 24	East of the Water Management Pond	Raw sewage	5,000	Broken pipeline flange



1.3 Rainbow Trout Early Life Stage (ELS) Toxicity Testing

➤ Dated January 2, 2013

- The chronic toxicity testing at the diffuser stations is a new requirement
 - An embryo/alevin/fry (EAF) test
 - An expected duration of approximately 70 days
- A number of logistical concerns associated with performing this test
 - Field safety concerns and challenges of collecting and shipping 120L/week for three-months
 - No laboratories maintain accreditation for either or the longer duration ELS tests
- Requested a shorter duration Rainbow Trout ELS test (7-daytrout embryo viability test)



1.4 Environmental Management System (EMS) Certification Assessment

- BSI conducted a re-assessment of De Beers existing certification (EMS72553, BS EN ISO 14001:2004) through December 10 to 13, 2012
 - On January 20, 2012, BSI concluded that Key Performance Indicators have demonstrated improvements; however, with respect to non-conformances, actions were not found to be effectively implemented
 - De Beers took actions to improve
 - No environmental non-conformances were noted in the December 2012 assessment



1.5 Notice of Winter Road Construction

➤ Dated January 8 & 10, 2013

- “contingent on ice thickness, construction will commence on the Snap Lake Spur Road on January 9, 2013 with a projected start date for traffic of January 30, 2013”



1.6 Annual Forecasting of Whole Lake TDS

➤ Dated January 9, 2013

- Water Licence requires annual forecast of whole lake average TDS in Snap Lake to verify that the TDS levels will remain below the compliance limit
- De Beers has not yet updated the forecast because more work than anticipated is required to provide reliable forecasting
- De Beers is working to update the lake and site model prediction for TDS and chloride
 - A technical memorandum will be submitted to the MVLWB in February 2013



1.7 Environmental Agreement Annual Reports – 2010, 2011

- Submitted on January 16, 2013
 - The 2010 EAAR was not submitted on time due to the receipt of a corrupt file containing a required translation document. Efforts were made to obtain the necessary translation document but unfortunately it was never received and the submission was overlooked. In 2012, SLEMA notified De Beers that the 2010 EAAR had not been submitted to date. Upon notification of the missing report De Beers made another request to obtain the document and was successful. The translation document was incorporated into the 2010 report.



1.8 De Beers Responses to ENR's Comments on Air Quality Monitoring (I)

➤ Dated January 21, 2013

- De Beers proposed, in June 2012, replacing the existing non-continuous (24-hour composite sample every sixth day) monitoring for TSP (three locations), PM₁₀ (two locations), and PM_{2.5} (two locations) with continuous monitoring (one-hour data for every hour of the year) for TSP and PM_{2.5} at two perimeter (upwind/downwind) locations
- ENR and SLEMA questioned the cessation of monitoring for PM₁₀ in November 2012 and June 2012, respectively



1.8 De Beers Responses to ENR's Comments on Air Quality Monitoring (II)

- “De Beers contends that the expected substantial increase in actionable, timely data that would be available if the proposed continuous TSP and PM_{2.5} monitoring were approved and implemented offsets any potential benefit lost from the cessation of monitoring for PM₁₀.”
- “While De Beers recognizes that this proposal is not explicitly consistent with the detailed prescription of the Environmental Agreement (Section 7.2), it is in keeping with the spirit of the Environmental Agreement which was drafted to guide the monitoring effort.”



1.9 De Beers Responses to December 20, 2012 Inspection Report (I)

➤ Dated January 23, 2013

- The Inspector concerned about the elevated concentrations of Total Suspended Solids, Aluminum, Copper and Zinc the uncontrolled surface runoff
 - De Beers compared the concentrations of sampling sites within the mine boundary and the reference sampling sites, and identified high degree of natural variability of those parameters in the area



1.9 De Beers Responses to December 20, 2012 Inspection Report (II)

- The Inspector concerned about the seepage from the Water Management Pond
 - De Beers requested Golder Associates Ltd. to address the concern, and Golder reviewed the Environmental Assessment documents and the Water Licence and made a few conclusions
 - The lack of consistent trends downstream of the WMP appears to be more indicative of natural material variability and natural trends in this area, including seasonality, resulting in temporally elevated concentrations of key parameters in several of the downstream bogs, rather than from direct influence or connection with the WMP



1.10 Notification of Purchase of Incinerators

- Dated January 29, 1013
 - De Beers is to replace the Ecowaste Incinerators with two new Ketek incinerators (model CY-100-CA), which will meet the conditions of the Land Use Permit, under section 26(1)(i), item 54, which states “The Permittee shall select a unit that is capable of meeting an emission concentration limit of dioxans and furans of 80 pg TEQ/m³”



2. Inspection Update

- AANDC Inspector – Patrick Kramers took over the Snap Lake file from Tracy Covey in January 2013
- No Inspection Reports received in January 2013



2.1 Questions regarding Repairs to Perimeter Sump #3

- Dated January 9, 2013
- Issued by the Inspector Jason Brennan
 - A request for information concerning recommended repairs to Perimeter Sump #3 resulting from the September 2012 Geotechnical Field Inspection of the North Pile Facility
 - A written reply is due on January 31, 2013



Information Requested by Jason Brennan

- A clear description of the repairs to be undertaken in plain, non-technical language and why such repairs have been deemed as necessary
- If and when such repairs have been scheduled to be implemented. (Including the proposed date of project commencement and completion)
- A sketch, diagram or photos indicating which section(s) of Perimeter Sump #3 are believed to be damaged and in need of repair
- Identifying if there are any seasonal restrictions or logistical challenges that might make the proposed repairs unachievable in the near term and prior to spring freshet of 2013
- The estimated length of time that it will take to complete the proposed repairs



3. Regulators' Update (I)

➤ MVLWB

- Updated the Work Plan for the Design Plan and Re-evaluation report on January 3, 2013
 - Questions of Clarification from reviewers due January 17, 2013;
 - AEMP Design Plan Workshop on January 24, 2013 (Lahm Ridge Tower);
 - Final recommendations due February 7, 2013;
 - De Beers responses to final recommendations due February 14; and
 - Information will be gathered and presented to the MVLWB at the next available meeting



3. Regulators' Update (II)

➤ MVLWB

- Extended both the due date of reviewers' recommendations and De Beers response for 5 days on January 25, 2013
- Distributed the Acid/Alkaline Rock Drainage and Geochemical Characterization Plan for review on January 31
 - Due on February 27, 2013
- Distributed the 2012 Plume Characterization Study Report for review on January 31
 - Due on February 20, 2013



4. Aboriginal Update

- No comments received from the Aboriginal groups in January 2013



5. Stakeholders' Update

- No comments received from other stakeholders in January 2013



6. Agency's Activities

- SLEMA staff attended the CIMP Forum from January 21 to 23, 2013
- SLEMA hired Barry Zajdlik to review the AEMP Design Plan
- SLEMA staff and Barry Zajdlik attended the AEMP Workshop held on January 24
- SLEMA reviewed the Environmental Agreement Annual Reports – 2010 and 2011, revisited De Beers Nutrient Modeling in 2011



7. SLEMA Reviews

- Environmental Agreement 2011 Annual Report
 - Submitted on December 20, 2012
- Environmental Agreement 2010 Annual Report
 - Submitted on January 10, 2013
- Nutrients Modeling in 2011



7.1 Environmental Agreement 2011 Annual Report

- The title Environmental Monitoring Agreement Report: 2010 is not consistent with the Environmental Agreement
- Section 1.2 2011 Annual Report: in the past, this section describe the previous year EAAR submission. For example, Section 1.2 of 2009 EAAR describes the submission of 2008 EAAR
- Section 4: in the past, this section summarizes the documents submitted in the current year. For example, Section 4 of 2009 EAAR summarizes the reports submitted in 2009, i.e. Water Licence annual reports, Air Quality report, vegetation report, and wildlife report for 2008, and TDS and DO reports for 2009
- Table 5-1 Summary of Compliance, 2011 is incomplete. The following are missing
 - The observations made and concerns raised by the Inspector
 - Summary of De Beers responses to the Inspector concerns



7.2 Environmental Agreement 2010 Annual Report

- The title Environmental Monitoring Agreement Report: 2010 is not consistent with the Environmental Agreement
- In page ii, Compliance, it is stated that 12 inspections in 2010, but in Table 5-1 there are only 11
- Section 1.2 2010 Annual Report: in the past, this section describe the previous year EAAR submission. For example, Section 1.2 of 2009 EAAR describes the submission of 2008 EAAR
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- Table 5-1 Summary of Compliance, 2010 is incomplete. The following are missing
 - The areas of the Mine that were inspected during each inspection
 - Summary of De Beers responses to the Inspector concerns



Recommendations from the Environmental Analyst

- It is necessary to revise the two submissions



7.3 Nutrients Modeling in 2011

- The Supporting Document #6 and #7 for the Water Licence Renewal in 2011 were revisited
 - Snap Lake Site Model Report
 - Predicted the water quality discharging to Snap Lake from the Mine and Mine site
 - Snap Lake Model Report
 - Predicted future concentrations of conservative and non-conservative water quality constituents



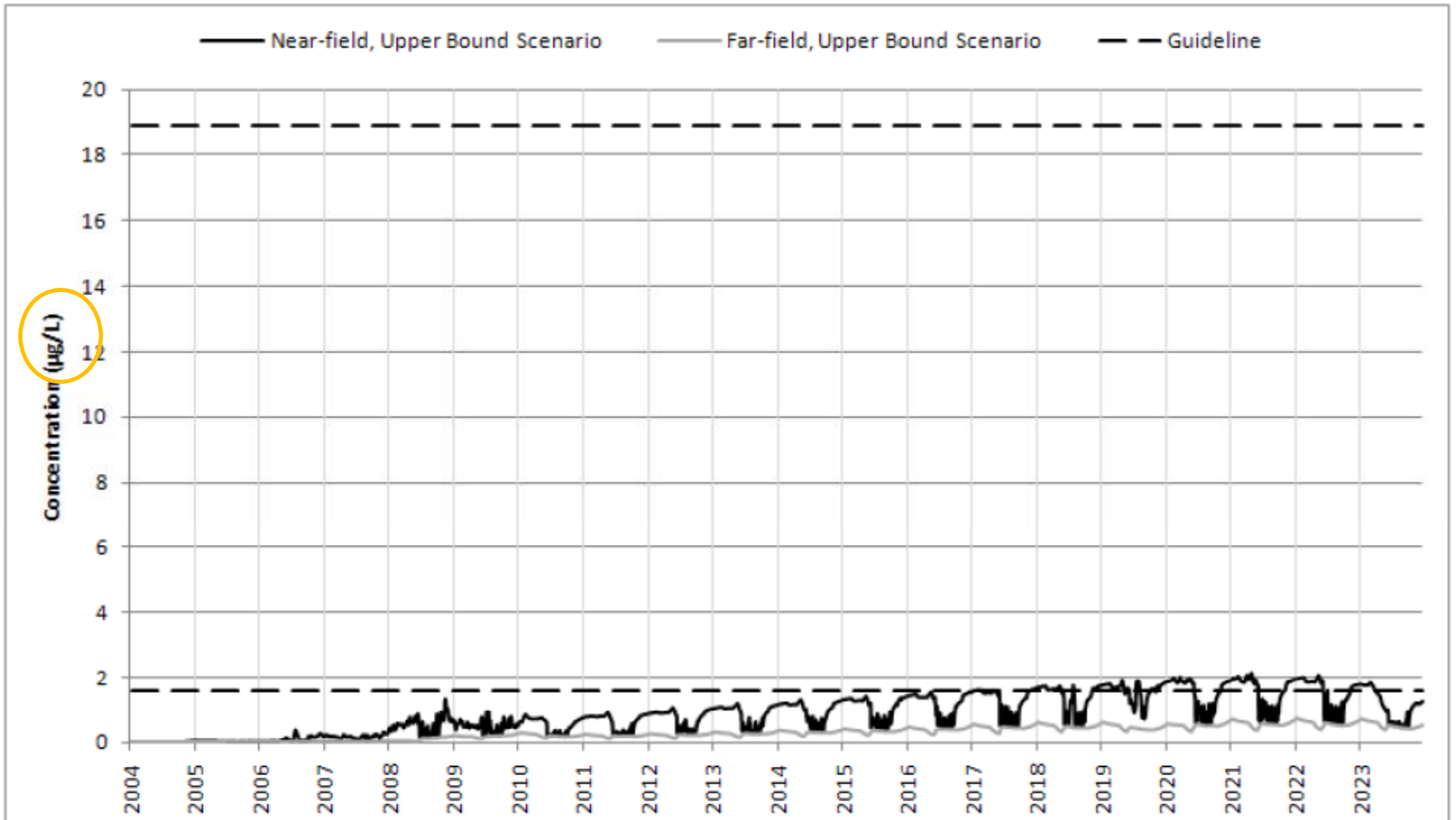
Nutrients Concentrations in Snap Lake Predicted in 2011

- Both nitrate and ammonia concentrations are predicted to be slightly lower than was predicted in the EAR. Ammonia concentrations are predicted to be slightly above the lower range of the pH and temperature dependent CCME water quality guideline of 1.58 mg/L but remain well below the upper range of 18.9 mg/L. Nitrate concentrations are predicted to be above the CCME water quality guideline of 2.93 mg/L, which was developed after the 2002 EAR



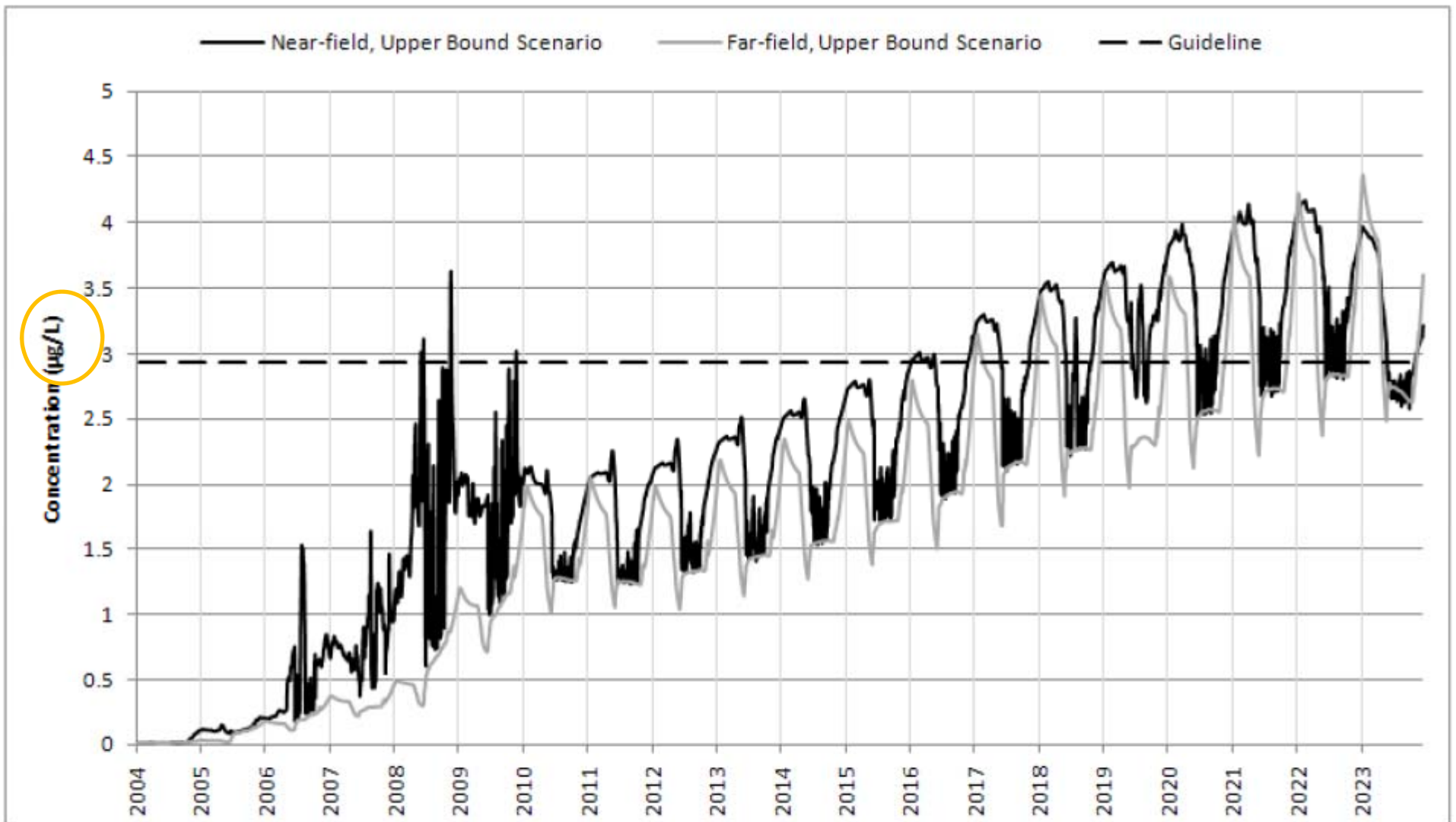
Predicted Ammonia Concentrations in Snap Lake

(from Figure IV.15 of Snap Lake Model Report)



Predicted Nitrate Concentrations in Snap Lake

(from Figure IV.15 of Snap Lake Model Report)



Comments from the Environmental Analyst

- In the Snap Lake Site Model Report, the mine life assumption was 19 years, and the beginning year was 2004. As a result, the peak flow or loading was predicted to be 2023/2024. However, the official opening was in 2008 and the mine life is expected to be 22 year. It means that the modeling in 2011 might under-estimate the impacts of mining operation on TDS levels and Nitrogen levels in Snap Lake



Comments from the Environmental Analyst (II)

- The unit used in Figure IV.15 and 16 of Lake Model Report should be mg/L, rather than $\mu\text{g/L}$
- Looking forward to reviewing the technical memorandum about modeling update to be submitted by De Beers in February 2013

