



October 2015 Environmental Update for SLEMA Board

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Outline

1. Mine Update
2. Inspection Update
3. Regulators' Update
4. Aboriginal Update
5. Stakeholders' Update
6. Agency's Activities
7. SLEMA Reviews
8. Snap Lake Working Group Meeting



Acronyms

- AANDC – Aboriginal Affairs and Northern Development Canada
- AEMP – Aquatic Effects Monitoring Program
- ARD – Acid Rock Drainage
- DFO – Fisheries and Oceans Canada
- CCME – Canadian Council of Ministers of the Environment
- CEQG – Canadian Environmental Quality Guidelines
- EC – Environment Canada
- ENR – Department of Environment and Natural Resources, GNWT
- EQC – Effluent Quality Criterion
- 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
- SSWQO – Site-Specific Water Quality Objective
- TDS – Total Dissolved Solids
- WEMP – Wildlife Effects Monitoring Program
- WTP – Water Treatment Plant
- WMP – Water Management Pond



1.1 Mine Update – September 2015

- Production rate: 77.4% of its capacity (73,109 tonnes of kimberlite processed)
- 5,282 m³ of water withdrawn from Snap Lake
- 1,588,742 m³ of treated water discharged into Snap Lake
- 57,549 tonnes of coarse reject and 38,396 m³ of slimes deposited in the North Pile
- 1 reportable spill (#15-410) on September 28
 - 0.25 L of oil released from the outboard of the ERT Boat into lake within 5 m of the shoreline. Booms and absorbents were deployed to collect the spilled oil immediately after the spill
- Water sampled in 9 monitoring stations
 - The monthly average for all parameters met compliance



1.2 Spill Reporting in October 2015

- No spill reports received in October 2015



1.3 De Beers' Update on 2014 Incinerator Stack Testing Results

➤ Dated October 6, 2015

- Responded to SLEMA letter on June 29, 2015
 - DE Beers had a meeting with SLEMA and ENR on August 6, 2015
 - During the meeting De Beers agreed to continue to work with ENR and EC to continuously improve camp waste incineration at the Snap Lake Mine Site



1.4 Waste Management Plan

- Submitted on October 8, 2015
 - An update from the January 2014 version
 - “Bulk Sample Pit” was added to the options list for on-site domestic waste disposal
 - Statement regarding 2014 stack testing was provided
 - Landfarm decommissioning
 - Movement Document/Manifest information was updated
 - Water treatment capacity volume was revised
 - Fuel capacity volume was updated



1.5 Results of Annual Fat Heat Minnow Early Life Stage Testing

➤ Reported on October 29, 2015

- The testing for Fathead Minnows commenced on September 30
 - Composite sample from 4 diffuser locations
 - A single fish mortality observed prior to Day 4
 - Mortality started to increase on Day 4 and continued through to Day 7
- No corresponding effects seen in the 7-d Rainbow Trout embryo viability test
- Effects on Ceriodaphnia reproduction in the individual diffuser station samples collected at the same time also of lower magnitude response

➤ The next step when such a result is received is to resample

- Current ice thickness no safe for sampling
- The next sampling scheduled in January 2016



1.6 Quarterly TDS Mitigation Implementation Report

- Submitted on October 30, 2015
 - The Reverse Osmosis (RO) project initiated in November 2015
 - A proof of concept (Phase I) unit fabricated in late 2014 and transported to site on the 2015 winter road
 - The location and selection of a building to house the RO equipment on site began in April 2015, and finalized in July 2015
 - The building procured in September 2015, due to be delivered to the Mine along the winter road in 2016



1.7 2015 AEMP Design Plan

➤ Submitted on October 30, 2015

- The original Aquatic Effects Monitoring Program (AEMP) for the Snap Lake Mine (Mine) was implemented in 2005 and updated in 2013.
- The present 2015 AEMP Design Plan is provided based on the most recent (2015) Water Licence, specifically: methods and analyses for water, toxicology, and plankton were re-examined and updated; and, the Response Framework for assessing the overall results of AEMP monitoring was updated for toxicology, plankton, and water
- The 2015 Design Plan update provides refinements, not major changes



2. Inspection Update

- Inspector – Jamie Steele
- Water Licence and Land Use Permit Inspections
 - No inspection reports received in October 2015



3. Regulators' Update – MVLWB (I)

- Held the Snap Lake Mine Working Group Meeting 4 on October 20, 2015



4. Aboriginal Update

- No comments received in October 2015



5. Stakeholders' Update

- ENR responded to SLEMA letter (dated June 29, 2015) about Incinerator Adaptive Management at Snap Lake Mine on October 14, 2015
- ENR and EC commented TDS Correlation with Inline Parameters on October 15, 2015



5.1 ENR Responses to SLEMA Letter about Incinerator at Snap Lake Mine (I)

- An update to the follow-up actions associated with the latest incinerator stack testing at Snap Lake Mine
- ENR has committed to developing a legislative framework for air quality management in the NWT, with a priority focus on regulatory tools for incinerator emissions. This development process is currently underway



5.1 ENR Responses to SLEMA Letter about Incinerator at Snap Lake Mine (II)

- ENR and De Beers met on July 15 and August 25, 2015 to discuss incinerator operations, issues, and to assess/review their adaptive management measures
- De Beers' investigation showed that the root causes of the stack test failures were
 - Improper operations (including ash accumulation) -> inconsistent and insufficient incinerator temperatures (temperature faults) -> emission exceedances
- ENR requested that evidence be provided to demonstrate that the operational issues being addressed and that they are effective



5.1 ENR Responses to SLEMA Letter about Incinerator at Snap Lake Mine (II)

- De Beers provided the temperature data from October 2014 to July 2015 and data analysis
 - Temperature faults were occurring less than 2% of the operating time
- ENR was satisfied with the data analysis and requested that De Beers conduct this data analysis every 6 months to demonstrate continued appropriate performance of the incinerators, and to capture any trend



5.1 ENR Responses to SLEMA Letter about Incinerator at Snap Lake Mine (III)

- De Beers agreed that they would conduct the data analysis again for the July to December 2015 data set, and then annually thereafter
- De Beers also committed to meeting every 6 months with ENR and EC to provide updates on the mitigative measures



5.2 ENR Comments on TDS Correlation with Inline Parameters (I)

- Conductivity is currently monitored continuously at SNP 02-17b using an in-line meter, and ENR is not certain that providing a single additional daily conductivity measurement at SNP 02-17b will give reviewers the best additional information in terms of regulating the effluent. However, additional information on daily TDS concentrations would be useful for providing information on the variability of the TDS concentration in the effluent. The maximum TDS (based on the maximum recorded in-line conductivity) and the average TDS (using an average of the recorded in-line conductivities) should be provided



5.2 ENR Comments on TDS Correlation with Inline Parameters (II)

- ENR recommends that the requirement for daily “on-site in-house chloride” measurements at SNP 02-17b be replaced with daily “in-house estimates of maximum and average TDS”



5.3 EC Comments on TDS Correlation with Inline Parameters

- EC is supportive of De Beers' requested change
 - De Beers requested that the Board approve a change to the requirements for sampling and reporting daily in-house chloride per Annex A; Part A.1; SNP 02-17b from *“daily on-site in-house chloride”*, to *“daily, on-site, in-line electrical conductivity”*



6. Agency's Activities

- The Yellowknives Dene First Nation appointed Alex Power to the SLEMA Core Group in replacement of Rachel Crapeau
- Annual General Meeting (AGM) held in Yellowknife on October 15 (morning), 2015
 - ❖ An short Executive Meeting held after the AGM on October 15 (morning), 2015
 - Arnold Enge (NSMA) appointed as the Chairperson
 - Charlie Catholique (LKDFN) appointed as the Vice Chairperson
 - Alex Power (YKDFN) appointed as the Treasurer
 - Johnny Weyallon (Tlicho) appointed as the Secretary
- Core Group Meeting held in Yellowknife on October 15 (afternoon), 2015



7. SLEMA Reviews

- Waste Management Plan



7.1 Waste Management Plan

- An update from the January 2014 version
 - “Bulk Sample Pit” was added to the options list for on-site domestic waste disposal
 - Statement regarding 2014 stack testing was provided
 - Landfarm decommissioning
 - Movement Document/Manifest information was updated
 - Water treatment capacity volume was revised
 - Fuel capacity volume was updated



Comments from the Environmental Analyst (I)

- The update of “Bulk Sample Pit” in the Revision History (page iii): it should be page 19 rather than 20
- Statement regarding 2014 stack testing in page 20: it is only mentioned that the stack testing results were reported, but without mentioning that the emissions of dioxins and furans were above the Canada Wide Standard. The statement “as per De Beers EMS, continuous improvement and adaptive management have been used to successfully operate the equipment to-date” is also confusing. So far, there are no data supporting the statement. Clarification is requested



Comments from the Environmental Analyst (II)

- The update of fuel capacity volume in page 36: in the version of January 2014, 20 small oil tanks (between 100,000 to 500,000 L) were listed in page 34. The updated version lists 19 small tanks, ranging from 330,000 to 500,000 L. Is the small oil tank (100,000 L) at the Fresh Air Raise decommissioned? The number of tanks (from 330,000 to 500,000 L) is 11 in 2014 version WMP, which is consistent with the 2015 version WMP (19). Clarification is requested



8. Snap Lake Working Group Meeting 4

- October 20, 2015
- Participants
 - Staff from MVLWB
 - Staff from De Beers and De Beers' consultants
 - Staff from MVEIRB
 - The Inspector
 - Staff from ENR and ENR's consultants
 - Staff from EC
 - Staff from YKDFN
 - Staff from DKDFN
 - Staff from SLEMA



Snap Lake Working Group Meeting on October 20, 2015



De Beers' Update and Open Discussion

- North Pile Activities
- TDS Removal Pilot Study
- AEMP Design Plan (to be submitted on November 1, 2015)
 - Low Level Response Plan (*C. dubia*)
 - ELS testing
- Downstream Watercourses Special Study Plan



Update on North Pile (I)

- There is not enough room in the pile to deposit mined rock until 2028 as originally planned
 - Close 0% processed kimberlite will go underground – North Pile Life of Mine Expansion assumption



- Total capacity = 6 million m³
- Mine life to 2028

Update on North Pile (II)

- 7 options proposed, and two of them presented
 - Raise Option – same foot print (1600m x 600m), but raise by 17 m (56 ft) – would be ~55m (180 ft) above Snap Lake
 - Expanded Footprint Option – same height (35m or 115 ft above Snap Lake, but extend westward by 550m (2150m x 600m)



- Same height as current pile, but extend westward by 500m
- New land disturbance
- Relocation of existing infrastructure (AN storage)

Update on North Pile (III)

- Preliminary design package for North Pile life-of-mine Expansion Project will be submitted in 2016
- Will require amendment of water licence, land use permit and Management Plans
- Design focus remains on maintaining a safe and environmentally sustainable facility while allowing for a continuous mine operation
- Closure considerations for the North Pile will be included



Update on TDS Removal Pilot Study

- Reverse Osmosis (RO) system components on site, but not hooked up
- Expected field testing in the spring/summer of 2016
- TDS Mitigation Implementation Quarterly Report due on October 30, 2015
- TDS Mitigation Implementation Plan due on July 31, 2016



Update on LUP Extension

- Land Use Permit MV2010D0053 will be expired on February 15, 2016
 - De Beers will submit extension application for its LUP MV2010D0053 in November 2015



Update on SNP Reporting

- The SNP of the amended Water Licence MV2011L2-0004 requires De Beers report TDS calculated and measured concentrations for SNP Stations 02-15, 02-17, 02-18 and 02-20
 - Only calculated TDS concentrations are reported in the August 2015 SNP Report
 - De Beers committed to reporting both TDS calculated and measured concentrations for SNP Stations 02-15, 02-17, 02-18 and 02-20 in future SNP monthly reports

