



November 2012 Environmental Update for SLEMA Board

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Outline

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



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 – October 2012

- Production rate: 81.6 % of its capacity (79, 681 tonnes of kimberlite processed)
- 3,308 m³ of water withdrawn from Snap Lake
- 964,395 m³ of treated water discharged into Snap Lake
- 78,578 tonnes of coarse reject and 54,636 m³ of slimes deposited in the North Pile
- 2 spills (1 reportable)
- Water sampled in 8 monitoring stations
 - The monthly average for all parameters met compliance



1.2 Spill Reporting in October 2012

| Date | Location | Waste Spilled | Amount (L) | Cause |
|------------|--------------------------|---------------|------------|---|
| October 10 | Outside of Process Plant | Process water | 200,000 | Process Plant lost power over night resulting in flooding of the plant, which spilled out of doors into receiving environment |



1.3 ICRP Meeting Clarification

- Dated November 5, 2012
 - A workshop in November 2012 for the Interim Closure and Reclamation Plan (ICRP) was proposed
 - Aboriginal groups had scheduling concerns
 - De Beers requested that the MVLWB defer the November 2012 workshop to February 2013



1.4 Response to Question Regarding Spill Follow Up Report

➤ Dated November 21, 2012

- The Inspector expressed concerns about emergency response plan and the pump and valve failure on November 13
- De Beers responded that
 - “Improvements to the emergency plan have been implemented. Procedures are currently being updated and will be completed in the next week”
 - “These valves have been repaired, are in functioning order, and have been incorporated into the maintenance system for regular inspection and service”



1.5 Flight Schedule and Accommodation

➤ Dated November 22, 2012

- Responses to the Inspector inquiry about the availability of flights to Snap Lake and overnight accommodation for the purposes of completing routine inspections
 - No flights for the Inspector to travel in and out on the same day
 - With sufficient notice, a seat on any scheduled flights will be accommodated, but overnight accommodation are not available due to room limitation at site
 - If additional flight is available, allowing the Inspector enough time to complete an inspection, De Beers will attempt to inform the Inspector of this opportunity



2. Inspection Update

- AANDC Inspector – Tracy Covey
- No inspection reports received in November 2012



2.1 Inspectors Direction (I)

- Dated November 15, 2012
 - Addressed to the Mine General Manager
 - “A review of SNP monthly reports from May-September of 2012 reveals a disturbing pattern of recurring non-compliance/exceedances of the effluent quality criteria (EQCs) of water licence MV2011L2-0004 which the Inspector must bring to your attention.”
 - Aluminum, Zinc, Copper, and TSS



2.1 Inspectors Direction (II)

- The Inspector, on September 6, 2012, directed De Beers to identify how they intended to control/remove Copper, TSS, and Zinc exceedances at SNP 02-05, 02-08, and 02-11
 - De Beers responded on October 18 and failed to satisfy the Inspectors' request
 - Occurrences of non-compliance in the subsequent months



2.1 Inspectors Direction (III)

- De Beers is directed to submit, by April 30, 2013, a strategy to ensure future compliance with EQCs at SNP stations monitoring uncontrolled-runoff
 - Action items which will need to take place to achieve those solution (including a basic description of both the action required and reasonable timelines for their completion



3. MVLWB Update (I)

- Reviewed the Closure Objectives and directed De Beers on November 22, 2012
 - To incorporate the attached closure objectives into the forthcoming version of the Interim Closure and Reclamation Plan (ICRP) and make any necessary changes
 - Include a definitions section
 - Include a commitment table



Closure Objective

applied to all aspects of mine closure

- Dust levels safe for people, vegetation, aquatic life and wildlife
- Drainage pathways for surface runoff are physically stable
- Surface runoff and seepage water quality that is safe for people, vegetation, aquatic life and wildlife
- Mine areas are physically stable and safe for use by people and wildlife
- Landscape features (shape and vegetation) match aesthetics of the surrounding natural area
- Safe passage and use for Caribou and other wildlife
- Re-vegetation targeted to priority areas



Closure Objective

applied to the North Pile

- Prevent PK from entering the surrounding terrestrial and aquatic environment
- Physically stable PK containment area to limit risk of failure that would affect safety of people or wildlife



Closure Objective

applied to the underground

- Flooding of the underground mine will have no impacts to aquatic habitats in source lakes
- Underground mine should not contribute to the contamination of ground or surface water
- Underground mine workings are physically stable



Closure Objective

applied to all site infrastructure

- Preventing remaining infrastructure from contaminating land or water
- On-site disposal areas are safe for people, wildlife, and vegetation
- Contaminated soils and waste disposal areas that cannot contaminate land and water



3. MVLWB Update (II)

- Distributed the AEMP Design Plan for review on November 30, 2012, and proposed the work plan
 - Questions of Clarification from reviewers due January 17, 2013;
 - AEMP Design Plan Workshop January 24, 2013;
 - 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



4. Aboriginal Update

- North Slave Metis Alliance (NSMA) appointed SLEMA new board members on, October 30, 2012
 - Arnold Enge as NSMA Director on the SLEMA Board
 - Eric Binion as Alternate Director



5. Stakeholders' Update

- ENR commented on De Beers proposed changes for air quality monitoring on November 14, 2012



Air Quality Monitoring

- De Beers proposed on June 13, 2012
 - Replacing the non-continuous monitoring of Particulate Matter nominally less than 2.5 micrometers aerodynamic diameter ($PM_{2.5}$) with continuous $PM_{2.5}$ monitoring;
 - Discontinuing monitoring of Total Suspended Particulate (TSP) and Particulate Matter nominally less than 10 micrometers aerodynamic diameter (PM_{10}); and
 - Revising select details of the response triggers in the Air Quality Emissions Management and Monitoring Plan (AQEMMP)



ENR Comments (I)

- ENR is supportive of replacing the PM_{2.5} Partisol samplers with the Sharp Model 5014i continuous PM_{2.5} monitoring samplers. ENR recommends that operators be trained in the operation and general maintenance of the instruments to ensure high rates of data capture and data validity



ENR Comments (II)

- The presented rationalization that TSP and PM₁₀ monitoring should be discontinued is not sufficient
- ENR recommends that, in the absence of sufficient justification for discontinuing the ambient monitoring of TSP and PM₁₀, DeBeers continue to monitor the larger particle fractions. ENR recommends that the existing equipment be either appropriately repaired or replaced with applicable instruments in order to ensure appropriate data capture



ENR Comments (III)

- ENR is supportive of modifications to the Action Levels to include a response for an increase in measured concentration, but not a decrease. ENR further recommends that DeBeers consider modifying the action levels to include a component on data capture, and a component on longer term trend analysis



ENR Comments (IV)

- The GNWT subscribes to the concept of “keeping clean areas clean”, and thus strives to set a high standard of environmental performance. The Snap Lake project encompasses approximately 500 ha, and thus aiming to achieve ambient air quality standards starting only at the fenceline of such a land mass would not promote the principle of keeping clean areas clean
- ENR recommends that air quality reporting for the De Beers Snap Lake mine appropriately reflect the intent of the NWT Guideline for Ambient Air Quality Standards and the air quality components of the Snap Lake Environmental Agreement



6. SLEMA Reviews

- Field Inspection Summary and De Beers responses to recommendations
 - Geotechnical inspection performed in September 2012 and reported on November 13
 - De Beers responded on November 14
- AEMP Design Plan
 - Submitted on November 26
 - To be reviewed



Geotechnical Field Inspection

- Geotechnical inspection performed in September 2012 and reported on November 13
 - North Pile (sumps and ditches, embankments, PK deposition)
 - Water Management Pond dams



Key Observations and Issues Identified

- Water Management were markedly improved
- A fundamental overall understanding of the North Pile is lacking on site
 - De Beers response – not addressed
- There are major deficiencies in the collection, interpretation and use of the monitoring data of the North Pile facility and WMP dams
 - De Beers response – not addressed
- The geotechnical department is not suitably staffed
 - De Beers response – in the process of investigating the structure of a hydrology department



Comments from the Environmental Analyst

- The technical memorandum looks satisfactory
 - The recommendations are supported
- De Beers implemented some recommendations, and is investigating some recommendations. However, two key issues about lacking understanding of the North Pile and deficiencies in monitoring data use appeared not to be addressed
 - It is recommended that De Beers take reasonable steps to improve the aforementioned key issues

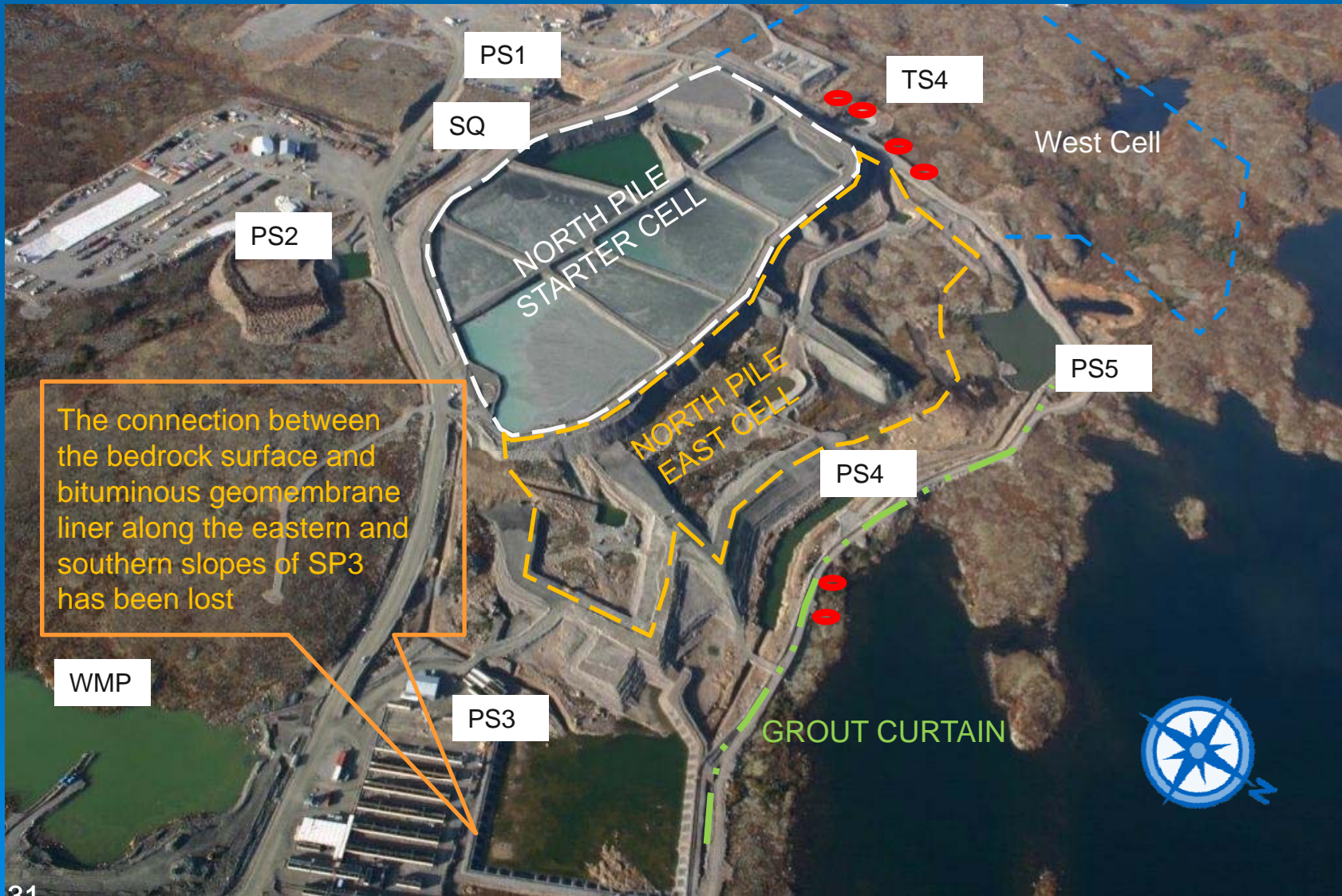


Issue about Perimeter Sump 3 (SP3)

- The connection between the bedrock surface and bituminous geomembrane liner along the eastern and southern slopes of SP3 has been lost as a result of water flows below the sump by-passing relieve valve flaps near the bedrock contact interface. Replacement of the geomembrane liner bedding layer has been compromised as a result from the flow of water into SP3. The liner bedding system is to be evaluated, and repaired as necessary, at the time of liner replacement. Once the liner and liner bedding system have been re-established, granular fills are to be placed over the entire surface of the geomembrane liner to provide confinement as previously recommended by Golder
- De Beers Response – under review



Snap Lake North Pile and Sumps



Questions from the Environmental Analyst

- Inquiry e-mail about SP3 sent to De Beers on November 20, 2012
 - “Would you kindly explain the implications of the lost connection between the bedrock surface and bituminous geomembrane liner along the eastern and southern slopes of SP3?”
 - Is there any link between the October 2011 spills and the lost connection?
 - Will it impact the operation of SP3 as designed?”



Responses from De Beers

- “The liner issues described by Golder along the southern and eastern slopes are to be repaired in March 2013
- The liner is compromised by inflow into PS3 and this is NOT related to the spills in October 2011
- Full scale repairs of liner with appropriate ballast, sealing (bentonite) etc is planned for July 2013 for ideal weather conditions and post freshet
- Currently we cannot operate PS3 to design until the above repairs have been done in July 2013. To mitigate any risks of leaks/spills, we will not allow the volume in the sump to exceed 13,000m³ (Elevation 445.757) even during freshet. This elevation/volume will ensure no seepage of water occurs”



Follow-up

- Further question from the Environmental Analyst
 - The water level maintained in PS3 (445.757) is still much higher than that in Snap Lake (444.1), is it safe to say “this elevation/volume will ensure no seepage of water occurs”?
- Response from De Beers
 - “Yes, it has been assessed by our water management team and it is well below the elevation in which problems can occur. I double checked on this concern before responding to your original questions”



7. Agency's Activities

- SLEMA Executive Meeting was held on November 7, 2012
- SLEMA chairperson and staff visited Lutsel Ke on November 22-23, and made presentations to the school, and the community (including elders, wildlife department and the council)

