November – December 2021 Environmental Update for SLEMA Board

January, 2022

Outline

1. Mine Update
2. SNP Reports
3. Water Monitoring
4. Incident at Site
5. Inspections
6. Regulatory News
7. Environmental Agreement Update
8. De Beers' News
9. SLEMA's Activities

Acronyms

- AEMP – Aquatic Effects Monitoring Program
- ARD – Acid Rock Drainage
- DFO – Fisheries and Oceans Canada
- ECCC – Environment and Climate Change Canada
- ECM – Extended Care and Maintenance
- ENR – Department of Environment and Natural Resources, GNWT
- EQC – Effluent Quality Criterion
- GNWT – Government of the Northwest Territories
- MVEIRB – Mackenzie Valley Environmental Impact Review Board
- MVLWB – Mackenzie Valley Land and Water Board
- PK – Processed Kimberlite
- SNP – Surveillance Network Program
- TDS – Total Dissolved Solids
- WEMP – Wildlife Effects Monitoring Program
- WTP – Water Treatment Plant

1. Mine Update

- The Snap Lake Mine is currently in Extended Care and Maintenance (ECM);
- Discharging of treated effluent to Snap Lake ceased on September 30th, 2021.
- There will be no effluent discharge during the fall and winter months, the effluent discharge will resume at the commencement of freshet 2022.

2. SNP Reports

- DeBeers submitted the following SNP Reports:

  - October 2021 SNP Report, and
  - November 2021 SNP Report.

- SNP Reports describe activities at the mine site, and on-site monitoring in October and November.

2. SNP Reports

- WATER MANAGEMENT AT SITE
  - Water Extraction from Snap Lake: The quantity of fresh water extracted from Snap Lake was:
    - 518 cubic meters (October)
    - 459 cubic meters (November).

  - The Sewage Treatment Plant (STP) operated in the month of October and November.
  - There was no mine water treatment or discharge to the environment in October or November.

2. SNP Reports

- GENERAL WASTE MANAGEMENT AT SITE

  - Glass jars, tin cans, and most food related plastic containers are washed and stored until they can be shipped off site.

  - Waste wood products and cardboard are burned in the authorized pit as per the LUP

  - Waste is handled as per the approved operational procedures for waste handling

2. SNP Reports

- No Site inspection was conducted in October.
- In November, a regulatory site inspection was completed on the 23rd of November by Joe Heron.
- There were no reported spills at the Snap Lake site during the months of October & November.

2. SNP Reports

- ENVIROMENTAL STUDIES/SURVEYS

- Fuel tank inspections;
- Air quality monitoring;
- SNP monitoring and sampling;
- Perimeter Sump monitoring and sampling;
- Monthly North Pile, ditch, and perimeter sump monitoring.

2. SNP Reports

- OTHER ON-SITE ACTIVITIES

  - Main camp building inspection;
  - Dam and Water Management Pond monitoring;
  - Collection of data from on-site piezometers and thermistors;
  - Geotechnical investigations;
  - Wildlife monitoring.

3. Water Monitoring

Fig 1: SNP Sampling Stations

SNAP LAKE ENVIRONMENTAL MONITORING AGENCY

3. 2021 WATER MONITORING SCHEDULE

Monitoring Station	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
02-02 North Pile	-	28	11[3] 27	11 26	08 22	05 19 29	16	
02-05 Run off Rock Pad			03	15				
02-06 Runoff Quarry		23						
02-11 WMP Dam								
02-14 WMP			05	03 17[1] 26[1]	08 22	05 19 30		

Missing Parameters:
3:missing ethylbenzene

3. 2021 WATER MONITORING SCHEDULE

Monitoring Station	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
02-15 Water Intake		11	15[1]	13	02 17	14	12 23	9
02-16i Sewage Effluent		21	29[4]	13[5] 27	29	13 28[2]	12 27	9 23
02-17b Treated Effluent		25	5 7[1] 15[1] 21 29	6 13 20 25	2[1]	6 17[1] 21 28		
02-20d 02-20e 02-20f Diffuser Stations	11 all MS		23 (all MS)	25 (all MS)	24	16 (all MS)		

1:missing coli
2:missing pH
4:incomplete
5:missing CBOD

3. 2021- WATER MONITORING

Results:

- Reported TDS in Snap Lake, at the mixing zone:

	TDS (mg/L) Jun	TDS (mg/L) Jul	TDS (mg/L) Aug	TDS (mg/L) Sep
SNP 02-20d	245	235	216	207
SNP 02-20 e	269	231	217	208
SNP 02-20 f	246	235	217	209

4. INCIDENT AT SITE

- Spill # 2021487, B-Dorm Sewage Leak on December 4th, 2021

- A clogged shower drain was reported in room 125 of the B-Dormitory of the main camp.
- An initial investigation determined the drain had frozen due to extreme cold.
- Additionally, the 3” drain line feeding the 6” main drain was cracked, and a quantity of black/grey water had leaked out and frozen underneath the dormitory.

4. INCIDENT AT SITE

- Spill # 2021487, B-Dorm Sewage Leak on December 4th, 2021

  - Further investigation confirmed approximately 200 L of combined black and grey water had leaked from the pipe and frozen on the ground beneath the B Dorm wing of the main camp accommodations complex.
  - The affected washroom was taken out of service to prevent more leakage and staff from the affected rooms were assigned new rooms.

4. INCIDENT AT SITE

- Spill # 2021487, B-Dorm Sewage Leak on December 4th, 2021

  - Following the incident, the water supply to the washroom was shut off and isolated to prevent additional leakage.
  - An initial report was submitted to the NT-NU 24-Hour Spill Report Line.
  - The Area was cleaned, and preventative repairs and maintenance were completed as necessary.

4. INCIDENT AT SITE

- Spill # 2021487, B-Dorm Sewage Leak on December 4th, 2021

FIG. 1 FROZEN SEWAGE AND DAMAGED PIPES

4. INCIDENT AT SITE

- Spill # 2021487, B-Dorm Sewage Leak on December 4th, 2021

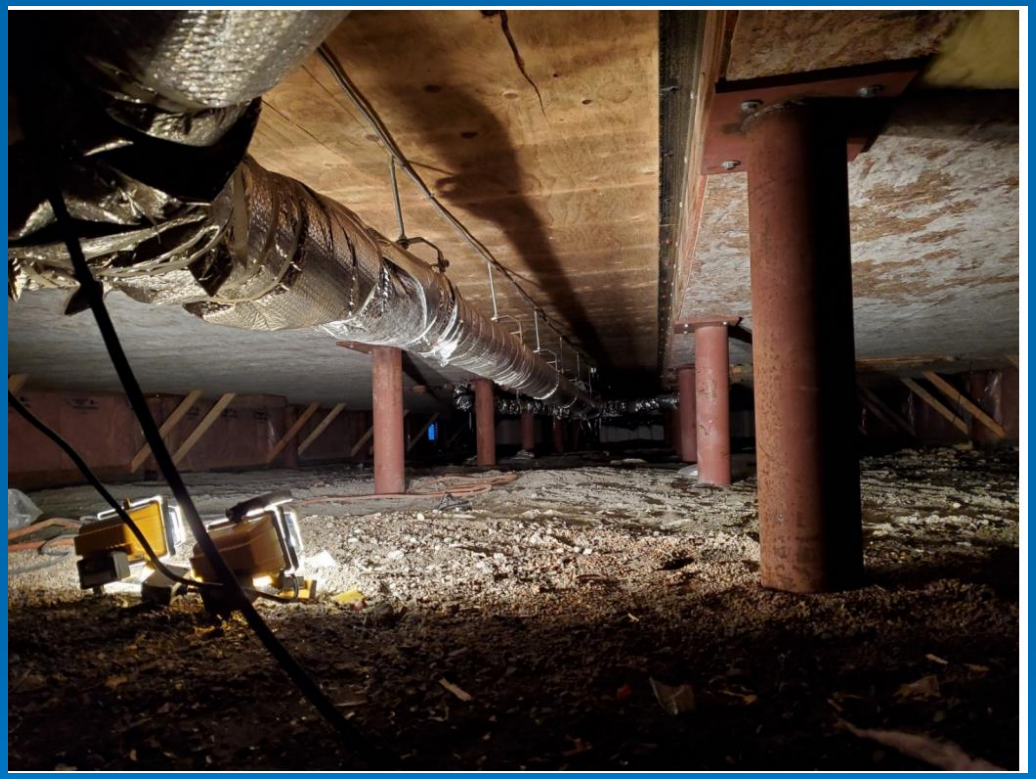

FIG. 2 COMPLETED REPAIRS

4. INCIDENT AT SITE

- Spill # 2021487, B-Dorm Sewage Leak on December 4th, 2021

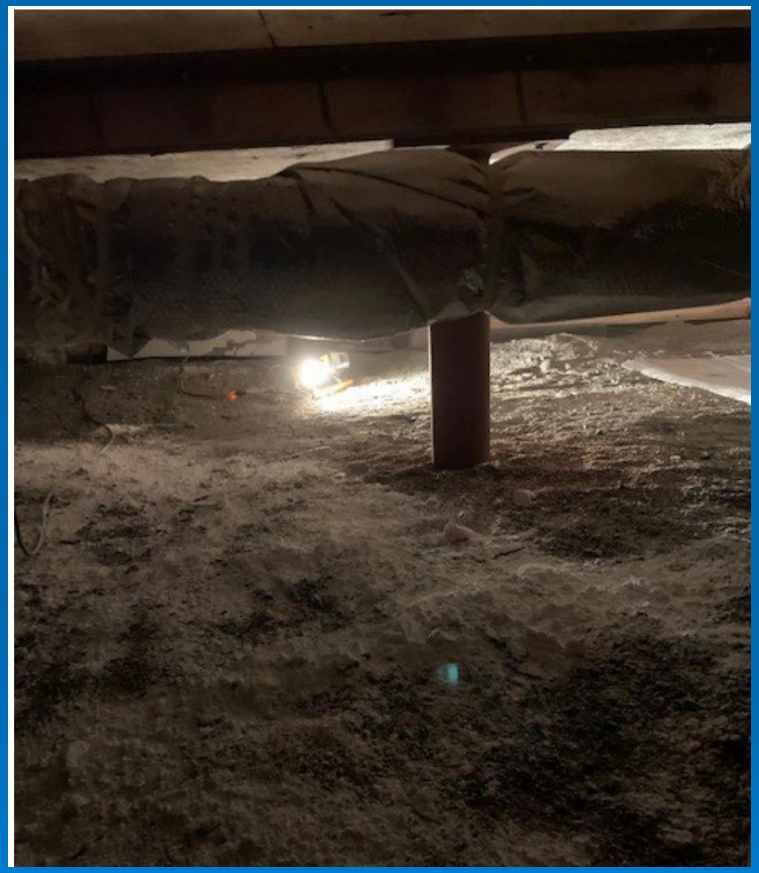

FIG. 3 APPLICATION OF HYDRATED LIME

4. INCIDENT AT SITE

- Spill # 2021487, B-Dorm Sewage Leak on December 4th, 2021

FIG. 4 SITE VIEW

5. Site Inspection Nov. 23rd

- Regulatory site inspection was conducted on November 23, 2021, by Inspector Joe Heron.

The following areas were inspected:

- North Pile Facility
- North Pile Perimeter Sump #3
- Fuel Storage Facilities & Tanks
- Waste Transfer Area & Incinerators

5. Site Inspection Nov. 23th

- Conclusions:

  - The Inspector was pleased with the efforts of personnel at the Snap Lake Diamond Mine to comply with the conditions annexed to Water Licence MV2019L2-0004 and its associated plans.

5. Site Inspection Nov. 23rd

Photo 1: Looking south at the North Pile the landfill is in the centre-right of the photo and Sump #5 can be seen in the bottom-right.

5. Site Inspection Nov. 23rd

Photo 2: Looking at the snow-covered North Pile East Cell-Cell 4.

Photo 3: The Godwin previously staged at the North Pile Sump #1 pumphouse has been put away for the winter.

5. Site Inspection Nov. 23rd

Photo 4: Looking north at the North Pile Sump #1.

Photo 5:Looking west at Sump #2 and the shut-down pumphouse. A staff gauge has been installed at the sump to assist with the surveyed elevations.

5. Site Inspection Nov. 23rd

Photo 6:Looking south at the pump-out and frozen North Pile Sump #3.

Photo 7: Looking east at the North Pile trench Sump #4 and pumping infrastructure.

5. Site Inspection Nov. 23rd

Photo 8: Looking at the east side of Sump #5, located north and adjacent to the North Pile.

Photo 9: Looking at the west side of Sump #5 just south of the IL6 Ditch

5. Site Inspection Nov. 23rd

Photo 10: Looking north at the mine Water Management Pond prior to freeze-up

Photo 11: The mine Light Vehicle fueling station is active and in use.

5. Site Inspection Nov. 23rd

Photo 12:Looking east at the bulk fuel offload station. Approximately 3 million litres of fuel will be delivered to the Snap Lake Mine via winter road during the Winter 2022.

Photo 13: Looking north at the TK-001 12 million litre bulk fuel holding tank.

5. Site Inspection Nov. 23rd

Photo 14: Looking east at tanks TK-002 and TK-003.
The decommissioned 10 million litre holding tank can be seen in the background.

Photo 15: An example of a fully stocked and labeled spill kit at the Snap Lake Mine.

5. Site Inspection Nov. 23rd

Photo 16: Waste onsite was being segregated, labeled and staged prior to its transfer to the mine Waste Transfer Area.

Photo 17: Looking at properly staged, labeled and containerized waste at the mine WTA.

5. Site Inspection Nov. 23rd

Photo 18: The mine maintains a labeling program to ensure waste is easily identified prior to processing and disposal.

Photo 19: Looking north at the mine incinerators and fuel tanks.

5. Site Inspection Nov. 23rd

Photo 20: This incinerator access hatch is used to remove incinerated materials

Photo 21: Looking north at an active burn bin and a holding bin. The Licensee must ensure only approved waste is burned in the bins.

5. Site Inspection Nov. 23rd

Photo 22: Materials awaiting incineration are separated prior to burning at the mine burn area.

Photo 23:Waste metals and ash from the mine incinerators and burn bins are place in this holding container.

5. Site Inspection Nov. 23rd

Photo 24:The waste metal and ashes are tested prior to disposal.

Photo 25: Looking east at recently pushed up waste at the mine landfill.

5. Site Inspection Nov. 23rd

Photo 26:The waste metal and ashes are tested prior to disposal.

6. MVLWB Regulatory Update

- Interim – Partial approval of the Snap Lake Mine Final Closure and Reclamation (FCRP) Plan - Version 1.1

  - On October 12, 2021, the Board approved the De Beers FCRP Version 1.1 for Snap Lake Mine as an interim submission
  - Board staff was directed to host a workshop to address the concerns regarding closure criteria and post-closure monitoring.

6. MVLWB Regulatory Update

- Interim – Partial approval of the Snap Lake Mine Final Closure and Reclamation (FCRP) Plan - Version 1.1

  - Following the workshop and submission of the Snap Lake FCRP Version 1.2, a review focused on closure criteria and post-closure monitoring, will occur through the Board's Online Review System.

  - Similarly, a focused review of the AEMP Design Plan Version 1.2 will also occur for Action Levels refined through the workshop.

6. MVLWB Regulatory Update

- Interim – Partial approval of the Snap Lake Mine AEMP Design Plan Version 1.1
  - In November, the Board interim approved De Beers' AEMP Design Plan Version 1.1.
  - Board Staff was directed to broaden the scope of the Closure Technical Workshop to include further discussion of the AEMP action levels.
  - The aim of this focused discussion is to address concerns related to the AEMP action levels and the relationship they have to closure criteria.

6. MVLWB Regulatory Update

- Approval of the Snap Lake Mine AEMP Design Plan Version 1.1

  - In November, the Board interim approved De Beers' the 2012 – 2020 Aquatic Effects Re-evaluation Report required under Water Licence MV2019L2-0004 for the Snap Lake Mine.

7. Environmental Agreement Update

- Satisfactory Determination of the De Beers 2020 Snap Lake Environmental Agreement Annual Report

In September 2021, copies of the 2020 Snap Lake Environmental Agreement Annual Report were distributed to Parties of the Environmental Agreement and SLEMA as per section 10.1(a) of the Snap Lake Environmental Agreement.

- The GNWT found the Annual Report in accordance with Article 10.1 of the Agreement and therefore satisfactory;
- Also, the GNWT encourages De Beers to address all comments from Parties.

8. De Beers Update

- DeBeers' Notification to the Inspector of commencement of land-use operations (LUP-Part C condition 6 and WL Part B Condition 20)

In December, a sampling of contaminated soil at select areas will be conducted as part of a detailed Environmental Site Assessment for closure work at Snap Lake. The following is the scope of work:

- Determine landfarm soil depths and areal extent and whether any liners are present in the existing landfarm cell (s).
- Determine if any other soil piles currently on-site are to be placed in the landfarm.
- Develop soil sampling/soil characterization test pitting plan.
- Complete soil sampling/soil characterization program.

9. SLEMA ACTIVITIES

- SLEMA reviews in November & December 2021:

1) Review of the Surveillance Network Program - SNP monthly reports

SLEMA reviewed October and November 2021 SNP Reports submitted by DeBeers.

9. SLEMA ACTIVITIES

- SLEMA submissions to the MVLWB in Nov. & Dec. 2021

On Nov. 5, 2021, SLEMA submitted comments on the De Beers' North Pile Management Plan Version 4.0 .

The North Pile M. P. is required under Part F, condition 4 of Licence MV2019L2-0004.

9. SLEMA ACTIVITIES

- SLEMA submissions to the MVLWB in Nov. & Dec. 2021

On Nov. 5th SLEMA submitted comments on De Beers' North Pile Design and Construction Plan Version 1.0.

The North Pile Design and Construction Plan is required by Licence MV2019L2-0004, Part E, condition 8.

9. SLEMA ACTIVITIES

- SLEMA submissions to the MVLWB in Nov. & Dec. 2021

On Nov. 5th SLEMA submitted comments on De Beers' Acid Rock Drainage and Geochemical Characterization Management Plan Version 1.0.

The ARD and Geochemical Characterization M.P. is required by Licence MV2019L2-0004, Part F, condition 5

9. SLEMA ACTIVITIES

- SLEMA Core Group Meeting and AGM

The SLEMA Board, E.D. and Tech Advisor met on December 1st, 2021.

The all day - meeting took place in Yellowknife.

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