



SNAP LAKE ENVIRONMENTAL MONITORING AGENCY

2016-2017 ANNUAL REPORT OF ACTIVITIES

MESSAGE FROM THE CHAIRPERSON

This year is the first since SLEMA's inception that the Łutselk'e Dene First Nation has chaired SLEMA, and I am happy for the opportunity given to me by the board to be involved in the management of the agency. While the Snap Lake Mine has been under Care and Maintenance since December 2015, SLEMA has diligently continued to monitor the environmental conditions at the mine site and has been very active in the review of several important documents stemming from both regulatory instruments like land use permits and water license, and requirements under the Snap Lake Environmental Agreement.

As a representative of one of the four First Nations that have signed the Environmental Agreement, I believe SLEMA is an important agency that must continue its independent oversight role until the Snap Lake mine has been fully closed and reclaimed and that long-term monitoring results required under its water license and land use permits have demonstrated that the company can walk away from the site, leaving it as it was before development, and without any long-term negative legacy on the environment and the people who depend on its health and bounty.

This being said, SLEMA is quite pleased with the manner in which De Beers has operated the mine and has continued to involve all stakeholders in ensuring that its operations met all conditions of the various approvals and the spirit and intent of the Snap Lake Environmental Agreement. We are also very pleased to see how De Beers has maintained the lines of communications open with the communities and has demonstrated a strong willingness to ensure the views and concerns of the communities will be incorporated into the closure and reclamation of the mine, once a decision to that effect is made by the company. SLEMA is also very pleased with the Environment and Natural Resources-GNWT's active involvement in the various technical reviews since devolution a few years ago. We are also thankful to the Lands Inspectors responsible for inspection and enforcement of water licenses and land use permits who have continuously kept the SLEMA board and staff informed of their findings on how De Beers meets its regulatory requirements.

James Marlowe, Chairperson

ABOUT SLEMA

The Snap Lake Environmental Monitoring Agency (SLEMA) is a non-profit independent environmental watchdog responsible for monitoring the environmental performance of the Snap Lake Mine and to support the Aboriginal parties throughout the life of the mine.

WHAT IS THE SNAP LAKE ENVIRONMENTAL AGREEMENT?

The Snap Lake Environmental Agreement is a binding contract between De Beers Canada, the proponent of the Snap Lake Mine De Beers, the Government of Canada, the Government of the Northwest Territories and four affected Aboriginal Organizations:

- the Tlicho Government,
- the Yellowknives Dene First Nation,
- the North Slave Metis Alliance, and
- the Lutsel K'e Dene First Nation.

WHO WE ARE

SLEMA is directed by a Core Group made up of eight board members appointed for an indefinite term at the discretion of the four Aboriginal groups. Four of these members make up the Executive Committee and are appointed annually at the Annual General Meeting.

SLEMA board also relies on two panels:

- The Science Panel that has largely been replaced by staff expertise;
- The Traditional Knowledge Panel, made up of eight Elders selected by the Aboriginal communities, meets twice annually or as needed depending on issues of concerns to the Aboriginal membership. The TK Panel is made up of:

Joe Rabesca, *Tlicho Government*

Eddie Jones and **Wayne Langenham**, North Slave Metis Alliance

Albert Boucher and **Madeline Drybones**, Lutsel K'e Dene First Nation

Mike Francis and **Napolean Mackenzie**, Yellowknives Dene First Nation

CORE BOARD MEMBERS (EXECUTIVE)



James Marlowe

Lutsel K'e Dene First Nation



Alex Power

Yellowknives Dene First Nation



Johnny Weyallon

Tlicho Government



Arnold Enge

North Slave Metis Alliance

ALTERNATE MEMBERS



Greg Empson

Yellowknives Dene First Nation



Adrian D'Hont

North Slave Metis Alliance



Noel Drybones

Tlicho Government



Charlie Catholique

Lutsel K'e Dene First Nation

OUR STAFF

SLEMA is managed by an Executive Director who liaise with the Board and external stakeholders, and administers the agency, and an Environmental Analyst who is responsible for reviewing the operational performance of the mine as it relates to all regulatory approvals, including the requirements of the Environmental Agreement. Together, the staff provides advice and recommendations to the Core Group in all aspects of its mandate.



Zhong Liu
Environmental Analyst

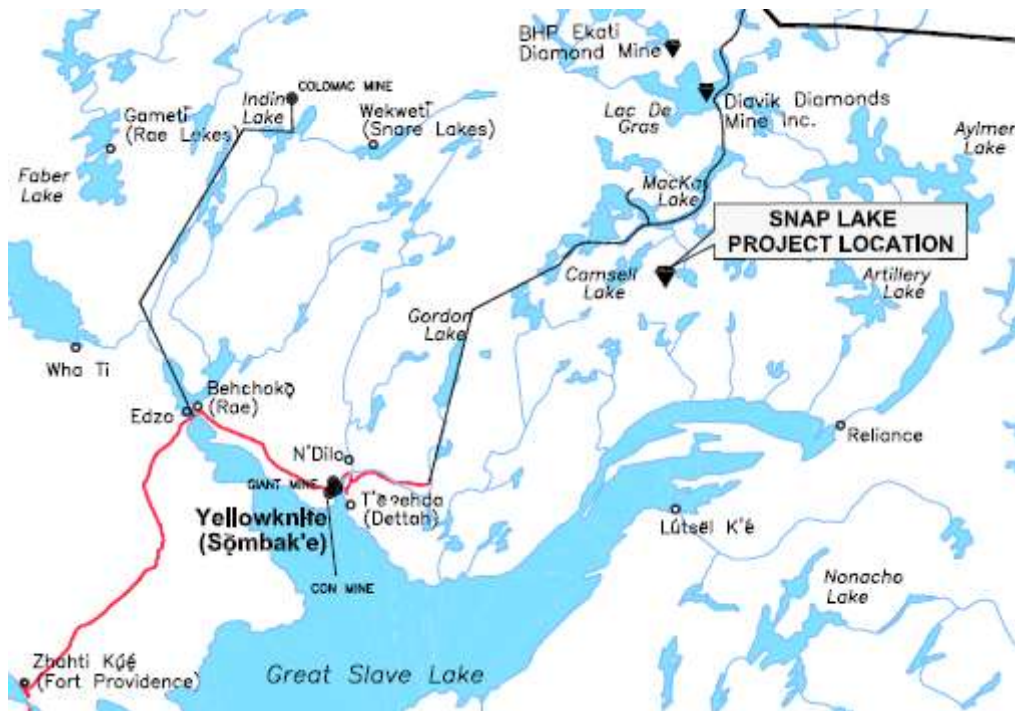


Philippe di Pizzo
Executive Director
(currently part-time)

THE SNAP LAKE MINE

The Snap Lake Mine is a diamond mine owned and operated by De Beers Canada. The mine is located about 220 kilometers northeast of Yellowknife, Northwest Territories. Mining began in 2007 and was expected to continue for 22 years until De Beers announced on December 4, 2015 that the mine was indefinitely being placed under care and maintenance. Since then, no kimberlite was mined and processed, but mine water has been pumped out of the underground and treated in the Water Treatment Plant throughout 2016.

Underground retreat was completed on February 9, 2017, and flooding of the underground workings continued throughout the year.



Location of Snap Lake Diamond Mine

SNAP LAKE MINE

- 1..... Air Strip
- 2..... Crusher/Waste Management
- 3..... AN Storage
- 4..... Emulsion Plant
- 5..... Starter Cell (North Pile)
- 6..... East Cell (North Pile)
- 7..... Fuel Storage
- 8..... Tire Shop
- 9..... Fresh/Fire Water Pump
- 10..... Cement Storage
- 11..... Satellite Mobile Shop
- 12..... Fresh Air Raise (FAR)
- 13..... Satellite Welding Shop
- 14..... Satellite Mine Shop
- 15..... Mine Portal
- 16..... Ore Conveyor
- 17..... Diffuser
- 18..... WTP Power House
- 19..... Heated Storage
- 20..... Main Shops/Warehouse
- 21..... Mine Dry/Admin
- 22..... Accommodation Facility
- 23..... Water Management Pond
- 24..... Lay Down/Cold Storage
- 25..... Organic Waste Collection
- 26..... Process Plant

DE BEERS
GROUP OF COMPANIES



Photo taken September 2013

Aerial View of the Mine Site

HIGHLIGHTS OF ACTIVITIES IN 2016-2017

- The SLEMA Board met in Yellowknife on May 2 and December 16, 2016 and March 17, 2017, as well as in Lutsel K'e August 29, 2016.
- SLEMA's Executive Committee met in Yellowknife on August 30, December 13, and December 16, 2016.
- SLEMA staff participated in the Snap Lake Mine Working Group Meeting on May 15, 2016.
- SLEMA hosted an Open House during community visit in Lutsel K'e on August 29, 2016.
- Noel Drybones represented SLEMA the Annual Fish Tasting Event at the Snap Lake Mine site on September 8, 2016.
- The 2016 Annual General Meeting was held in Yellowknife on December 15, 2016.
- SLEMA conducted the review of De Beers' annual environmental reports, monitoring programs and management plans, and study reports and made numerous comments and recommendations throughout the year.
- Monthly Environmental Updates are prepared and published on the SLEMA's website (www.slema.ca), and distributed to all stakeholders.



SLEMA Board Meeting in Lutsel K'e, August 29, 2016



SLEMA Open House in Lutsel Ke on August 29, 2016



Fish Tasting at the Mine, September 8, 2016

(Photography Courtesy of De Beers Group of Companies)

LIST OF DOCUMENTS SLEMA REVIEWED

- 2015 Annual Wildlife Effects Monitoring Program Report
- 2015 Annual Wildlife and Wildlife Habitat Protection Report
- 2015 Vegetation Monitoring Annual Report
- 2015 Air Quality Meteorology Monitoring and Emissions Annual Report
- Request to Alter and Suspend Reporting Requirements
- 2015 Environmental Agreement Annual Report
- 2015 Water License Annual Report
- 2015 Hydrology Annual Report
- 2015 Annual Closure and Reclamation Progress Report
- 2015 AEMP Annual Report
- Spill #16-147
- 2016 Geotechnical Inspection of North Pile and WMP Dams
- Extended Care and Maintenance Plan
- Extended Care and Maintenance Management Plans
- Request to Change SNP
- AEMP Design Plan
- Delayed ICRP update
- Interim Closure and Reclamation Plan

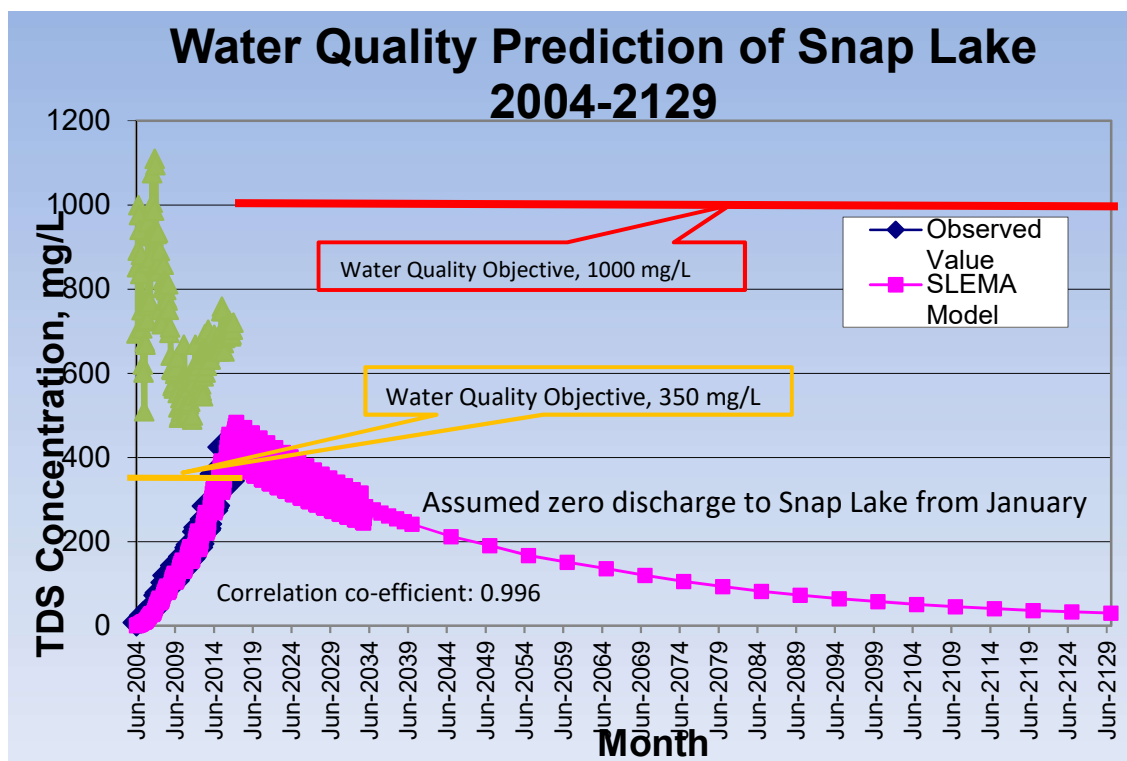
All reviews conducted by SLEMA on the entirety of plans and reports submitted by De Beers, are available on the SLEMA website.

MODELING UPDATE – EXTENDED CARE AND MAINTENANCE

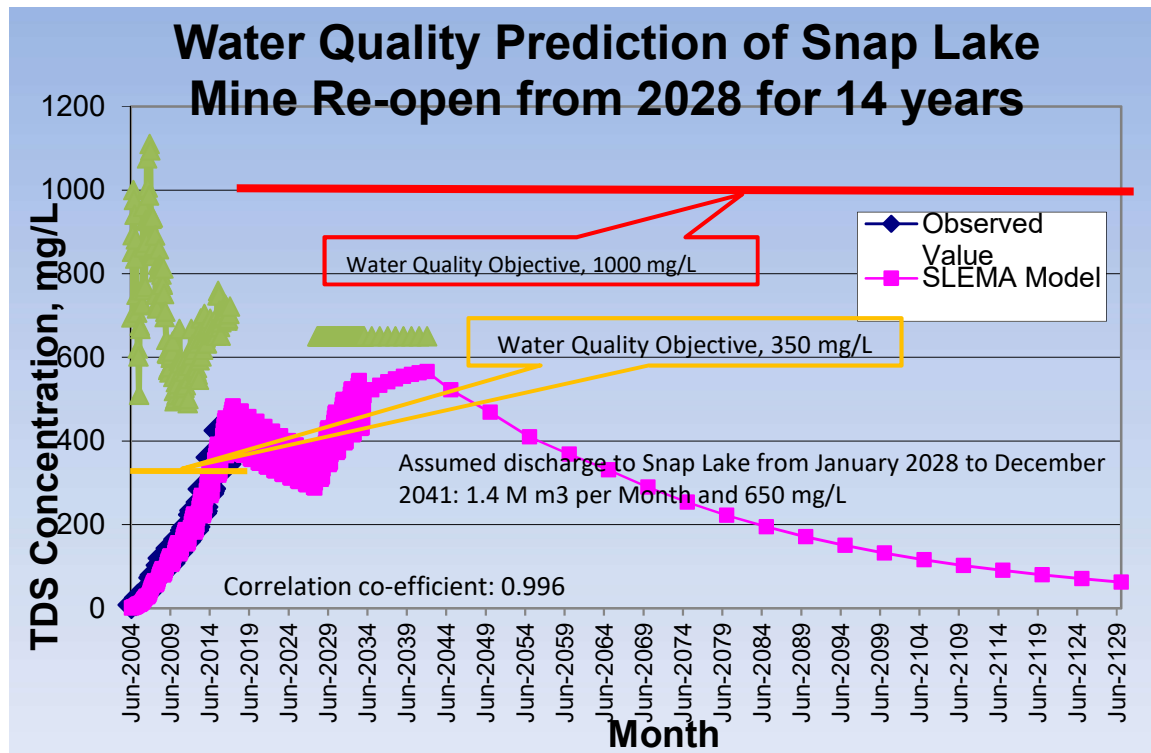
SLEMA updates the water quality model of the mine annually for Total Dissolved Solids (TDS). The model was updated in January 2017 to reflect the flooding scenarios during Extended Care and Maintenance of the mine.

Two scenarios were analyzed for Total Dissolved Solids in Snap Lake for 100 years.

- Scenario 1: the Mine will not re-open. Zero discharge is assumed.
- Scenario 2: the Mine will re-open in January 2028, and close in 2041, for a mine life of 14 years, with an assumed discharge to Snap Lake from January 2028 to December 2041 of 1.4 million m³ per Month and 650 mg/L of TDS.



Prediction under No-Reopen Scenario



Prediction under Reopen Scenario (2028-2041)

Modeling results show that under Scenario 1 (no re-open), TDS levels will decrease all the way, due to the natural dilution, and TDS levels will be between 26 – 30 mg/L in 2129.

Modeling results show that under Scenario 2 (re-open in 2028, for a mine life of 14 years), TDS levels will decrease from 2017 to 2027, and then go up (2028-2041) and down again due to the Mine re-open and final closure thereafter. TDS levels will be between 55 – 63 mg/L in 2129.

In summary, TDS levels will be a down trend due to the suspended operations and underground flooding, and as a result, the impacts on aquatic life will be much less than under normal operations. Modeling for a period of 100 years just provides a clear trend, and the results may not be accurate.

ASSESSMENT OF THE MINE

Based on a close monitoring and analysis of information made available by De Beers, SLEMA is generally satisfied that De Beers operated the Mine in a way that upheld the vast majority of its environmental commitments during the reporting period of 2016-2017.

During the period of the Care and Maintenance, De Beers has been taking diligent efforts in managing the mine site, including removing explosives and hydrocarbon related materials from the underground workings, ongoing dewatering and treatment operations for the minewater, preparing Extended Care and Maintenance Plan and updating related management plans and monitoring programs.

In conclusion, SLEMA appreciates De Beers responsible temporary shutdown planning and practices, and encourages De Beers to continue the diligent efforts after flooding the underground workings during the period of the Extended Care and Maintenance.

ASSESSMENT OF REGULATORS

SLEMA not only monitors the environmental performance of De Beers but also that of various regulators responsible for the Mine. In general, the regulators remain effective in making sure that De Beers runs the Mine in a way that maintains the majority of its environmental commitments.

HOW TO REACH US

By telephone

Executive Director: 867-765-0961
Environmental Analyst: 867-765-0962

By Email

exec@slema.ca

In person (by appointment)

5120 49 Street, 3rd Floor
Yellowknife NT X1A 1P8

By Mail

P.O. Box 95
Yellowknife NT X1A 2N1

Website: www.slema.ca