Snap Lake Environmental Monitoring Agency

2015-2016
ANNUAL REPORT

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Message from the Chairperson

On behalf of the Board of Directors, Elders and staff of the Snap Lake Environmental Monitoring Agency (SLEMA), I am pleased to present the activities of the agency for the 2015-2016 fiscal period. This includes a detailed report and our audited financial statements. We are happy to report that SLEMA has managed its activities within the funds provided by De Beers Canada.

As the independent environmental monitoring agency, we continue to report on the environmental management plans approved by the regulatory agencies for the operation of the De Beers Canada (DBC) Snap Lake diamond mine. SLEMA would like to comment that through the reporting period, DBC operated within the water licence conditions set by the Mackenzie Valley Land and Water Board (MVLWB).

The regulatory process kept our staff, Executive Director, Philippe di Pizzo and Environmental Analyst, Zhong Liu very busy. DBC had submitted an application to amendment their water licence which triggered an approval process with the Mackenzie Valley Environmental Impact Review Board. When conditional approval was provided, the MVLWB then set the concentration limit for total dissolved solids to be released into the environment.

It is with regret that we acknowledge the suspension of mining operations at the Snap Lake diamond mine in December 2015. While we hope the retail diamond market recovers sufficiently to bring the mine back into production, we will review and comment on the protective performance of De Beers Canada's care and maintenance plans.

Arnold Enge, Chairperson

Chaırperson Weyatì

Dǫ Board k'è dehkw'e, ǫhda eyıts'ǫ Snap Lake Ndè Hoìdı nı̨htł'èkǫ̀ dǫ eghàlaede 2015-2016 xo k'è ayıì k'è eghàlag̨i̱da wenı̨htł'è hǫt'e. Dı nı̨htł'è k'è t'ası hazǫ k'è eghàlats'ıìda eyıts'ǫ sǫmba edàtłǫ edaànı wek'ehoı̨wo wegodı dek'èhtł'è. De Beers Canada sǫmba t'à gots'àg̨i̱dì t'à SLEMA wenı̨htł'èkǫ̀ t'ası hazǫ k'è eghàlag̨i̱da eyıt'à mahsı ts'i̱ìwǫ hǫt'e.

Ndè Hoìdı gha nı̨htł'èkǫ̀ ats'ı̨t'e t'à, ı̨łè xo tat'è ndè k'è edaànı eghàlageèda gha edexè sìgogeèhʔı̨ sıì naàwo hohłe t'à zǫ De Beers Canada (DBC) Snap Lake dıamond mıne sǫmbak'è etł'e hǫt'e. SLEMA wenı̨htł'èkǫ̀ dı hagedı ha g̨i̱ìwǫ, ı̨łè xo ghàà DBC tı nı̨htł'è atł'e ghàà eghàlag̨i̱da, Mackenzıe Valley Land and Water Board (MVLWB) wetł'a edaànı tı t'à eghàlageèda gha nı̨htł'è atł'e ı̨le.

Naàwo hohłe ghàà eghàlats'eèda t'à dǫ gogha eghàlaede, nı̨htł'èkǫ̀ gha k'aowoh, Phılıppe dı Pızzo eyıts'ǫ Ndè Naàwo k'è eghàlaeda dǫ, Zhong Lıu hotł'o eghàlag̨i̱da. DBC tı t'à eghàlageèda gha nı̨htł'è ładı̨ agele gha Mackenzıe Valley Envıronmental Impact Revıew Board ts'ǫ nı̨htł'è agı̨la heʔę gedı t'à dı haànı goxè hoʔǫ agodza. Dı haànı ha nıdè gedı, eyıts'ǫ MVLWB t'ası edàtłǫ tı tah ts'ǫ̀ ìłè ha gedı ghàà tı tah t'ası edàtłǫ wets'oelı̨ sıì ndè tsǫ̀ anagele ha.

Snap Lake dıamond gha sǫmbak'è December 2015 k'è etłe le adza ko gogha dì ı̨le. Įdaa nı̨de dıamond kwè dètı naedı anadza nı̨de sǫmbak'è etłe anade ha ts'i̱ìwǫ, De Beers of Canada edaànı sǫmbak'è sìg̨i̱ìwhǫ ha eyıts'ǫ edaànı wekèhodı ha nı̨htł'è hohłe sıì wehots'ıìhdı ha hǫt'e.

Arnold Enge, Chaırperson

Betå'ás naki Dené si Dené bá yaki nîæâ

Jâ Dené bá yaki nît'â si t'â Dené bébá si Æâånedhé-u tth'i t'â Dené behél gháládá si diri Snap Laké Æasié ts'îdhí ch'á hél gháladá si æats'édi(SLEMA) hulyé,kú sînî sî jâ nehél hasnî si t'á ghâ si t'at'u jâ æasié hadi si ghâ t'á xaiyé nîlé si 2015-2016 xaiyé k'é hodi.T'á ghâ dené hél hadi si t'at'u æasié hadi hél tth'i t'á ts'ên tsambá k'ôdher si ghâ dené hél hadi.Nuwé nî duwé jâ nehél hadi si æaké nezô t'at'u tsambá nuwé tå'al yá si æaké dagharé t'á æasié hel gháladá badi si ts'ên tsambá k'ûdher æat'é.

Ku nunî thêné ts'ên æasié tsîdhi ch'á hél gháládá si æaåô t'at'u æéghalaídá si ghâ Dené hél haidí tth'i t'â æasié ghâ k'aldé dâlî si tth'i begharé æéghaládá æat'é diri t'â bebá si De Beers Canada hulyé(DBC) Snap Lake tthé luzé ghâ nats'édé si æts'édi.SLEMA si æaké t'at'u ku ts'î æeritå'ís begharé gháladá æat'é t'â dené si Mackezie Valley Land and Water Board(MVLWB) hulyé.

T'â bedagharé æasié ts'îdhí ch'á hel gháladá si æaké nezô dené bebá æasié gháladá si t'â dené æáts'édi si k'aldher Philippe di Pizzo chu t'â æaké æasié haåni dené Zhong Liu bebá lá åâ nîlé.BDC æeritå'is nîåchuth si ku ts'î bet'á diri Mackenzie Valley Enviromental Impact Review |Board.Ku t'át'u æasié hadi si ts'î æeritå'ís si begharé gháladá si MVLWB si ku hel gháladá æaké yaånî hoæâ diri t'á ku serîdhên si béká æasié hûlî haæaîlé t'á ku kâzíl xâ nôdher dé.

Hat'é huli dô si jâ tsambá k'é gháladá hunîdher si tsambá darîkâ æat'é harél yô lá horîåæâ Snap Laké tsambá k'é t'o hájá si kath yaki Zá 2015 xaiye ku.Ku tthé luzé ghâ nats'edé si dekilé t'á beghâ nanî si yunaghé ts'ên t'aåghâ yunedhé tthé luzé deki najá dé tsambá k'é daharékî nadåî ghonî.Dô æéyer gháladaí lé hulí tsamba k'é naré æasié hadi hulat'é De Beers Canada si æaké yaånî æat'é t'at'u yaånî xá senuæâ nîlé si gharé.

Arnold Enge, Betå'ás naki Dené.

What Is SLEMA

The Snap Lake Environmental Monitoring Agency's (SLEMA) Board was created pursuant to the De Beers Snap Lake Diamond Project Environmental Agreement, established between De Beers, Government of Canada, Government of the Northwest Territories and the 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. The mandate of SLEMA is to support the aboriginal parties in protecting the environment, support liaison and communication between the parties, support De Beers and Government in protecting the environment, review environmental performance, serve as a public watchdog for the regulatory process, and provide a public repository for reports and plans in relation to the Snap Lake Project.

What Are SLEMA's Responsibilities

SLEMA's mandate is established under Article IV Section 4.2 of the Environmental Agreement and is as follows.

(a) support the Aboriginal Parties' efforts to protect the environmental interests on which they rely;

(b) support collaborative and information-based liaison amongst all the Parties;

(c) support De Beers, Canada and GNWT in their respective efforts to protect the environment;

(d) review and monitor the environmental performance of the Project using western science and traditional knowledge;

(e) work with De Beers to mitigate environmental impacts of the Project thereby mitigating the potential for socio-economic effects;

(f) serve as a public watchdog of the regulatory process and the implementation of this Agreement;

(g) make recommendations to anybody having regulatory or management responsibility for a matter, for the achievement of the purposes and guiding principles in this Agreement;

(h) facilitate programs to provide information to and consult with the members of the Aboriginal Parties;

(i) report to the Parties and the public on the Monitoring Agency's activities and the achievement of its mandate; and

(j) provide an accessible and public repository of environmental data, studies and reports relevant to the Monitoring Agency's mandate.

How Is SLEMA Structured

SLEMA is directed by a board of eight, made up of two representatives each from the four signatory Aboriginal groups. The board also relies on two panels: a Science Panel and a Traditional Knowledge Panel. SLEMA has two full time employees, an Executive Director who

administers the agency, and an Environmental Analyst who reviews documents from De Beers and also provides advice to the board.

Executive Board Members

Arnold Enge

Chairperson

North Slave Metis Alliance

Charlie Catholique

Vice Chairperson

Lutsel K'e Dene First Nation

Johnny Weyallon

Secretary

Tlicho Government

Alex Power

Treasurer

Yellowknives Dene First Nation

Board Members

Greg Empson

Yellowknives Dene First Nation

Adrian D'Hont

North Slave Metis Alliance

Noel Drybones

Tlicho Government

James Marlowe

Lutsel K'e Dene First Nation

Traditional Knowledge Panel

Eddie Camille and **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

Snap Lake Diamond Mine

The Snap Lake Mine (Mine) is a diamond mine owned and operated by De Beers Canada Inc. (De Beers), and is located about 220 kilometers northeast of Yellowknife, Northwest Territories (NWT). De Beers received regulatory approval for the Mine in 2004, which included a Water Licence, a Land Use Permit, Land Lease, and a Fisheries Authorization, as well as specific obligations under an Environmental Agreement. Mining began in 2007 and is expected to continue for 22 years.

Map 1. Location of Snap Lake Diamond Mine

De Beers has committed to maintaining the highest environmental management standards. The Snap Lake Mine is the only diamond mine in the NWT that has certified its environmental management systems to the international standard ISO 14001, throughout advanced exploration, construction and operation.

The Mine maintained production levels between 10.5% and 119.2% of full capacity through 2015. 1,065,213 tonnes of kimberlite were processed, and about 1.3 million carats of diamond were produced.

Within 2015, approximately 858,099 tonnes of coarse reject of processed kimberlite (PK), 585,061 m^3 of slime were deposited into the North Pile, and no paste were backfilled into the underground. 102,503 m^3 of fresh water were withdrawn from Snap Lake, and 17,579,859 m^3 of mine water, collected runoff and seepage water were treated in the Water Treatment Plant and discharged into Snap Lake. In addition, 1,049,795 m^3 of water were recycled in the Mine.

Photo 1. Aerial View of the Mine Site

De Beers submitted two amendment applications for Water Licence MV2011L2-0004 to request changes of terms and conditions, especially the Effluent Quality Criteria (EQCs) in December 2013 and November 2014, respectively. After near two years of regulatory processes, De Beers obtained the interim EQCs in May 2015 and final EQCs in September 2015, respectively.

De Beers submitted a request for two-year extension of Land Use Permits MV2010D0053 and MV2014D0010 on December 1, 2015, and was granted on January 21, 2016.

De Beers announced on December 4, 2015 that Snap Lake Mine was being placed under care and maintenance effective Friday, December 4, 2015.

There were eight Water Licence inspections and four Land Use Permit inspections conducted by the Inspector of the Department of Lands in 2015.

Agency Activities 2015-2016

- SLEMA's Executive Committee met in Yellowknife on April 29, May 25, August 12, October 15 and November 13, 2015, and February 8 and March 30, 2016.
- The SLEMA Board met in Yellowknife on June 25, October 15 and December 16, 2015, and February 3, 2016.
- SLEMA staff Philippe di Pizzo and Zhong Liu presented SLEMA at the Career Fair in Lutsel K'e on May 22, 2015.
- SLEMA Board members and TK Panel members visited the Mine site on June 24, 2015.

- One workshop with the Board and elders from the Traditional Knowledge (TK) Panel was held in Yellowknife on June 25, 2015.
- SLEMA observed the Fish Tasting Event at the Snap Lake Mine site on September 10, 2015.
- The Yellowknives Dene First Nation appointed Alex Power to the SLEMA Core Group in replacement of Rachel Crapeau in September 2015.
- The 2015 Annual General Meeting was held in Yellowknife on October 15, 2015.
- SLEMA staff participated in the 4th Snap Lake Mine Working Group Meeting on October 20, 2015 and the 5th Meeting on February 15, 2016.
- SLEMA hosted a Holiday Open House on December 9, 2015 together with IEMA and EMAB.
- 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, which are described in the following sections.
- Monthly Environmental Updates are prepared and published on the SLEMA's website (www.slema.ca), and distributed to all stakeholders.

Photo 2. Career Fair in Lutsel K'e on May 22, 2015

Photo 3. Mine Site Visit on June 24, 2015

Photo 4. TK Workshop on June 25, 2015

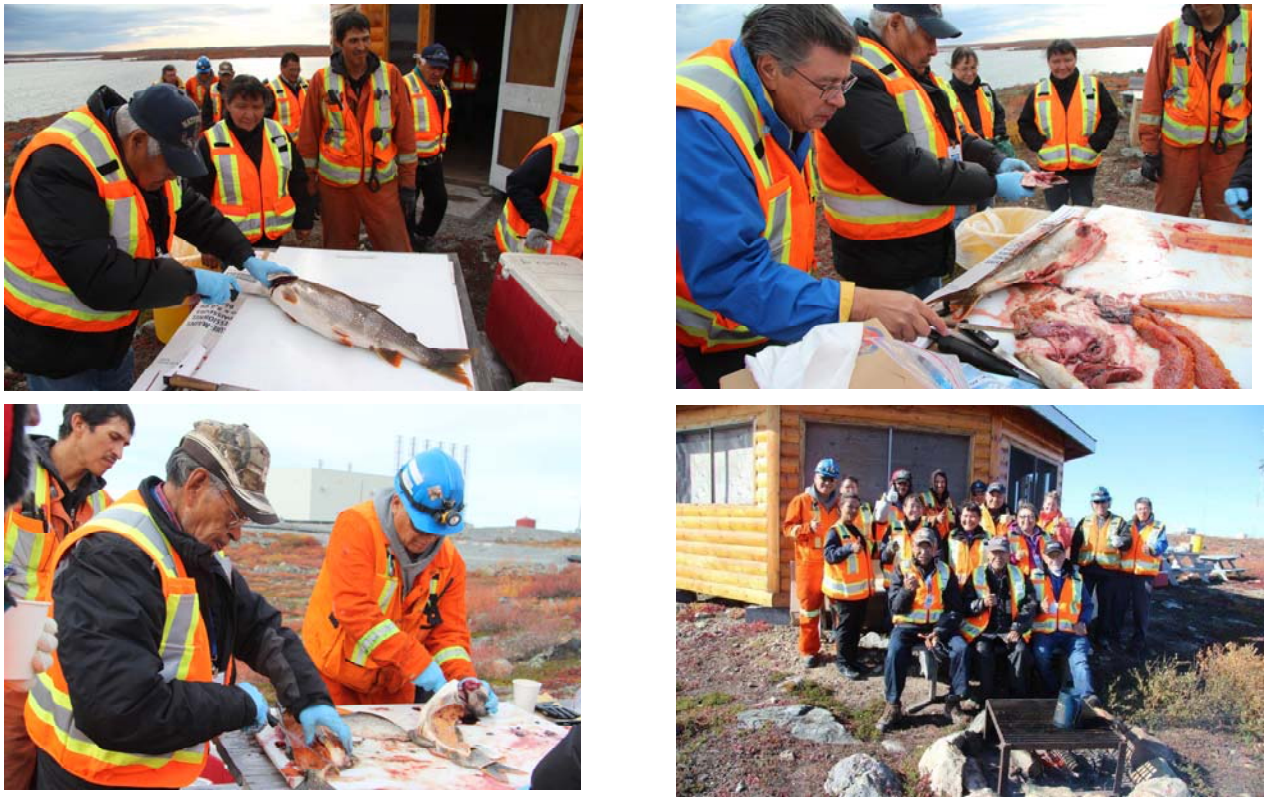


Photo 5 to Photo 8. Fish Tasting Event on September 10, 2015

(Photography Courtesy of De Beers Group of Companies)

Photo 9. The 4th Snap Lake Mine Working Group Meeting on October 20, 2015

Traditional Knowledge Panel

Traditional Knowledge Workshop

SLEMA held one Traditional Knowledge (TK) workshop for the North Pile and Vegetation on June 25, 2015, immediately after the Board members and TK Panel members visited the Mine site on June 24.

During the June 25 workshop, De Beers staff made presentations about the North Pile and Vegetation, and then TK panel members asked questions and made comments.

TK Panel members' observations and comments on the North Pile and Vegetation were presented in the Sections of 2014 Annual Wildlife and Wildlife Habitat Protection Report, 2014 Vegetation Monitoring Annual Report, 2014 Annual Closure and Reclamation Plan Progress Report, and North Pile Development.

Environmental Agreement

2014 Annual Wildlife Effects Monitoring Program Report

De Beers submitted the 2014 Annual Wildlife Effects Monitoring Program (WEMP) Report and the 2014 Annual Wildlife and Wildlife Habitat Protection Plan (WWHPP) Report on March 30, 2015.

In May 2013, the Government of the Northwest Territories (GNWT) circulated draft guidelines and proposed a change to how wildlife monitoring should be reported. The guidelines proposed dividing wildlife monitoring results into Wildlife and Wildlife Habitat Protection Plan (WWHPP) and Wildlife Effects Monitoring Program (WEMP) reports. The WWHPP Report describes wildlife monitoring occurring at and immediately adjacent to the Mine, whereas the WEMP Report describes wildlife monitoring occurring at spatial scales beyond the Mine footprint. To comply with the reporting guidelines proposed by the GNWT, De Beers prepared separate WWHPP and WEMP reports.

Through 2014, the effects of the Mine to wildlife have been within the range predicted in the Environmental Assessment Report (EAR). In 2014, the monitoring of caribou and bears indicated low levels of interaction with the Mine by these species compared to other operating mines in the NWT.

Caribou pass through the regional study area and have been occasionally observed at the Mine. Caribou are monitored through the movements of satellite-collared animals, observations by employees at the Mine and with aerial surveys by helicopter. The number of caribou observed has been very different from year to year since surveys began in 1999 and likely reflects the reduced herd size of Bathurst caribou. In 2014, an aerial reconnaissance survey was completed and determined that there were not enough caribou groups to complete behavioural scan surveys.

In 2013 and 2014, De Beers (on behalf of the Mine and the Gahcho Kué Project) participated in a regional grizzly bear program in collaboration with Dominion Diamond Ekati Corporation and Diavik Diamond Mines Inc. that will help the GNWT monitor and assess Cumulative Effects.

In 2013 and 2014, De Beers (on behalf of the Mine and the Gahcho Kué Project) also participated in a regional wolverine program that will provide demographic information for the conservation and management of wolverines in the NWT.

2014 Annual Wildlife and Wildlife Habitat Protection Report

Wildlife habitat loss due to the expanding Mine footprint has occurred as expected and the Mine as of 2013 was approximately 89 percent (%) of the total predicted size. The Mine is now nearing the maximum predicted footprint and further changes are mostly associated with the expansion of the North Pile. As such, the Mine footprint will be assessed less frequently, with the next Mine footprint assessment scheduled for 2017.

Incidents are defined as any wildlife interaction that requires a response by Mine personnel and may range from simple deterrent actions to the injury or death of an animal. Eighteen wildlife incidents were recorded at the Mine in 2014. These incidents included six involving wolverines, five involving birds, six involving fox and one involving an Arctic hare. Wildlife mortalities have been infrequent at the Mine. In 2014 eight wildlife mortalities were recorded at the Mine and included one wolverine, four birds, two foxes and one Arctic hare. Worker education, effective mitigation and good waste management have been considered essential in limiting wildlife incidents and mortalities since the initiation of Mine operations.

In 2014, the Mine continued regular inspections by the environmental department for the presence of wildlife, wildlife sign and food waste around the exterior of the airstrip, North Pile, accommodation complex, emulsion plant, power plant and water treatment plant and waste management areas. The results of inspections indicated that 21.63 percent (%) of surveys recorded presence of wildlife, 22.34% wildlife sign and 1.06% food waste at these Mine areas. Over time, the results of these surveys provide a standardized measure of wildlife presence at the Mine and the effectiveness of the waste management system.

Regular monitoring for wildlife presence, wildlife-traffic collisions, public use and wildlife harvest along the Mine winter access road began in 2013 and was continued in 2014. Wildlife detected near the Mine winter access road were ravens, caribou and a red squirrel. Evidence of wildlife-vehicle collisions was not observed, nor were any reported to the Mine. Public use or wildlife harvest along the winter access was not observed during any of the surveys.

During the site visit and following the TK Workshop on June 24 and 25, 2015, TK Panel members made comments related to wildlife and wildlife habitat.

- *"White crown sparrow seeing.*
- *Grey cheeked thrush was spotted.*
- *Mosquitoes like blue and black colors.*
- *Caribou trail northwest of the AN storage.*
- *Caribou eat lichen, grass and mushrooms (the kind of grass in the wet bog areas).*
- *This pond (WMP assumed) is what caribou like, when there are hot days they like these puddles.*
- *Caribou will come back once the lichen are back.*
- *Caribou will come up the slope if there is something to eat.*
- *Caribou use the same trail, now because of mine the caribou have changed their routes, it will take some time to come back.*
- *No caribou here, too noisy, used to be lots of caribou here.*
- *Caribou will come up (to the North Pile) if it is solid and to get away from the mosquitoes.*

- *Caribou are really afraid of noise."*

2014 Vegetation Monitoring Annual Report

De Beers submitted the 2014 Vegetation Annual Report on May 15, 2015.

A Vegetation Monitoring Program (VMP) is a requirement of the Mine's Environmental Agreement and provides support for the closure and reclamation monitoring requirements of the Mine's Water Licence.

A VMP was first prepared for the Mine in 2005. A subsequent VMP was prepared in 2008 and again in 2013. Next one will be in 2018 and every five years thereafter.

Dustfall monitoring results in 2014 are presented in the Annual Report.

- Total dustfall measurements did not exceed the Alberta Ambient Air Quality Guideline (AAAQG) for commercial and industrial areas (158 milligrams per square decimetre per 30 days (mg/dm²/30d)) at any on-site location. The reference station DF006 did not exceed the AAAQG of 53 mg/dm^2/30d for residential and recreational areas.
- The maximum deposition rate of 112 mg/dm²/30d was recorded at dustfall station DF011 in June/July 2014.
    - In May/June, June/July, and July/August 2014, the off-site total dustfall samples exceeded the Alberta Ambient Air Quality Guideline of 53 mg/dm^2/30d for residential and recreational areas (AAAQG). Additional monitoring was not triggered.
- The average total dustfall rate in 2014 (41 mg/dm²/30d) was 2% lower than observed in 2013 (42 mg/dm²/30d), and 13% lower than observed in 2012 (47 mg/dm²/30d).
- These results cannot solely be used to determine whether dustfall is affecting vegetation communities.
    - The Alberta dustfall guidance document was developed in 1975 to address aesthetic concerns associated with elevated dustfall levels.
    - There are no scientifically defensible relationships between these dustfall guidance and discernible effects on vegetation communities.

Vegetation is inspected visually to assess possible effects of dustfall on vegetation. Structured and focused visual inspections of dustfall on vegetation are conducted every five years as per the VMP.

During the 2004 and 2005 field surveys, 11 passive regeneration permanent sample plots (PSPs) were established at existing disturbed sites to determine the rate and effectiveness of passive regeneration as a revegetation method (i.e., natural revegetation relying on establishment or colonization by local species). Disturbed sites were the quarry at the esker, the airstrip, and the temporary camp.
There were no signs of dust accumulation or impacts to vegetation in surveyed reference or exposure PSPs in 2013 or any other survey to date. Dust accumulation was observed around the

airstrip, particularly on the west end of site. Signs or symptoms of stress were not observed on vegetation during qualitative assessments in 2013.

Efforts have been made to reduce dust deposition around the airstrip through the application of water to the airstrip and surrounding area. De Beers has been investigating the potential use of other approved dust suppressants

SLEMA reviewed the Report and did not raise any concerns.

During the site visit on June 24, 2015, TK Panel members identified the following plants at the mine site and made related comments.

- *"Red Bearberry (red in fall),*
- *Bark Birch (dwarf birch),*
- *Miniature cranberry (microcarpa) grows on Moss Campion ,*
- *Moss Campion,*
- *Forest Tail,*
- *Black Spruce ,*
- *Pink Willa (carnivorous plant),*
- *Sphagnum (baby diapers), and*
- *Steriocolumn (lichen that caribou don't like)."*

TK Panel members also made comments on the plants grow-up.

- *"Climate change brings plants they haven't seen before.*
- *Grasses/sedges in drier areas.*
- *First will be shrubs (dwarf birch).*
- *It takes 50 years for most lichen and 200 years for most shrubs.*
- *Disturbed patch near AN pad, Labrador tea and dwarf birch, was coming in.*
- *Alder tree grows fast.*
- *Plants grow well in areas where they have not been disturbed.*
- *Willows will come back first and easy.*
- *Horse tails will be preferred by caribou and horse tails need moist areas."*

All of the above observations were discussed with De Beers staff during the TK Workshop on June 25, 2015.

2014 Air Quality Meteorology Monitoring and Emissions Annual Report

De Beers submitted the 2014 Air Quality Meteorology Monitoring and Emissions Annual Report on May 29, 2015. This report provides the results of the air quality and meteorological monitoring programs that were active at Snap Lake during 2014.

Meteorological monitoring results in 2014 are summarized as follows.

- 2014 quarterly wind patterns were similar to 2013.
- Monthly air temperature averages and relative humidity measured at Snap Lake were consistent with patterns and ranges measured in Yellowknife.
- Annual peak solar radiation occurred in June, consistent with previous years
- The total annual rainfall recorded at the Hill Station in 2014 was 107.7 millimetres (mm), slightly higher than the Yellowknife total for 2014 (104.6 mm) but lower than the Yellowknife long-term (1981 to 2010) annual rainfall average of 170.8 mm.

The passive monitoring of SO_2 and NO_2 in 2014 indicated concentrations well below the applicable criteria.

- The annual average SO_2 concentration was 0.4 micrograms per cubic metre ($\mu g/m^3$), which was a decrease of 0.1 $\mu g/m^3$ from 2013 and below the Northwest Territories (NWT) Ambient Air Quality Standards (AAQS) of 30 $\mu g/m^3$.
- The annual average NO_2 concentration was 1.9 $\mu g/m^3$, a decrease of 0.4 $\mu g/m^3$ from 2013 and was still below the NWT AAQS of 60 $\mu g/m^3$.

The Dichot Partisols that measured PM_{10} and $PM_{2.5}$ located at the airstrip and explosives emulsion plant were decommissioned in July 2014 and replaced with 5030 SHARP $PM_{2.5}$ monitors in November 2014. Exceedances of the NWT AAQS were recorded for TSP at the wetland station and for $PM_{2.5}$ at the airstrip and the explosives emulsion plant stations. Annual TSP and $PM_{2.5}$ averages measured in 2014 were higher than those measured in 2013, while the annual average for PM_{10} was lower than that recorded in 2013.

Fuel consumption was approximately 37,748 cubic meters (m^3) of diesel with a maximum sulphur content of 15 parts per million by weight. The space heating furnaces predominantly used diesel for fuel, but also used 30 m^3 of waste oil in 2014. Fuel consumption in 2014 is similar to the amount used in 2013, while monthly tonnage of waste burned in 2014 was overall less than the tonnage burned in 2013. Emission rates in 2014 were similar to those reported in 2013, and remained below the emission rates predicted in the 2007 Air Modelling Update.

SLEMA did not raise any concerns except the stack testing of two incinerators.

Incinerator Stack Testing

The Mine currently has two Ketek Model CY-100-CA-D incinerators, which began operation in June and August 2013. Stack testing of these incinerators in accordance with stack testing protocols outlined in the Canada-Wide Standards (CWS) for Dioxins and Furans occurred on July 11 to 15, 2014.

De Beers submitted the 2014 Snap Lake Incinerator Stack Testing Report on January 29, 2015 to Environment Canada (EC) and the Government of the Northwest Territories (GNWT), Department of Environment and Natural Resources (ENR). This report was reviewed by SLEMA and was followed by email communications between De Beers and SLEMA in February 2015.

On June 29, 2015, SLEMA sent a letter to De Beers, and stated that SLEMA was extremely concerned about De Beers' failure to meet dioxin and furan CWS and, as importantly, about the lack of regulation of air emission in the territory. Therefore SLEMA requested a formal update on the situation.

By copy of the letter to the Government of the Northwest Territories, SLEMA also requested this issue in particular, and the issue of air emissions in general, be brought to the attention of the Snap Lake Liaison Committee for discussion and follow up.

De Beers responded on October 6, 2015 that De Beers had a meeting with SLEMA and ENR on August 6, 2015, and 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.

ENR responded to SLEMA letter about Incinerator Adaptive Management at Snap Lake Mine on October 14, 2015. ENR provided 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.*
- *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.*
- *De Beers provided the temperature data from October 2014 to July 2015 and data analysis. The 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.*
- *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."*

SLEMA replied to ENR letter on November 18, 2015 and stated that

- SLEMA was satisfied that the Government of the Northwest Territories is committed to developing a legislative framework for air emissions in the NWT in general, as well as regulatory tools for emissions from incinerators in particular. SLEMA was looking forward to seeing some concrete action on this initiative.
- SLEMA was also pleased by the steps taken by De Beers to address possible operational and management issues with the two incinerators, its commitment to work cooperatively with ENR and EC to address the matter, and its agreement to provide incinerator temperature data to both levels of government every six months.

- SLEMA requested to be copied on all temperature and other data submitted by De Beers that have been submitted to date on the incinerators' performance, as well as any new data that will be submitted as part of its commitment to address air emissions from the incinerators.

Liaison Committee Meeting

Liaison Committee is an obligation of the Environmental Agreement. There had been confusion regarding the membership of the committee, but following the Annual General Meeting, SLEMA agreed it was composed of one member each from De Beers, ENR and the Core Group, and not members of the individual Aboriginal Parties.

One informal meeting of the members of the Liaison Committee was held in SLEMA office in Yellowknife on August 6, 2015. Board members and staff from SLEMA, staff from De Beers and staff from ENR attended the meeting. The topics included the format of Environmental Agreement Annual Report, Liaison Committee, and Incinerator Stack Testing / Regulation of Air Emissions.

Format of Environmental Agreement Annual Report

ENR and SLEMA discussed the format and Table of Contents of Environmental Agreement Annual Report at the end of August 2015, and provided the following directions to De Beers in September 2015.

1. Formatting: the format of the report shall be kept; table of contents covers all the requirements from Environmental Agreement Article 10.1.
2. Editing: more attention when editing, correct typo mistakes, missing references, paragraph construction.
3. Content: the report is well formatted, but its content must have consistency between the sections and thoroughly reviewed before submission. For instance, information presented in the executive summary but not added in the body of the report.
4. Table 2.1: should be simplified and not only be a “copy paste” from Section 4 (example in a separate word document).
5. Sections 3 and 4: the results shall be presented in a more simplified language, with graphics, charts and photos to illustrate how the mine is monitoring its environmental issues, showing how the EA predictions were accurate or not. Add Appendix with the technical information.
6. If there are any updates for the environmental management plans and monitoring programs, it is recommended that De Beers highlight those changes from year to year.
7. Section 4.1.6 Type A Water Licence Annual Report: This Section must be a summary of this report, presenting the main results like: volume of fresh water use, volume of waste water discharges, volumes deposited in North Pile, volume of waste rock place in the North Pile, some key results from SNP.

2014 Environmental Agreement Annual Report

De Beers submitted the draft 2014 Environmental Agreement Annual Report (EAAR 2014) on January 11, 2016. SLEMA reviewed the draft EAAR 2014 and provided comments via e-mail on February 16, 2016. De Beers made related revisions and submitted the official report with aboriginal language summary on March 4, 2016.

SLEMA requested improvements in the description of compliance issues, responses to public concerns and report presentation on February 16, 2016. In response to SLEMA's comments, De Beers made the following revisions in the official submission.

- De Beers added three sub-sections into Section 5 Summary of Compliance.
  - Sub-section 5.1 AEMP Action Level Responses Triggered in 2014.
  - Sub-section 5.2 SNP Exceedance of Average Monthly Limit – Chloride.
  - Sub-section 5.3 Waste Licence Exceedances at SNP 02-16i.
- De Beers added responses to public concerns in Section 8 Summary of Public Concerns.
- De Beers added the figures of 2014 Windspeed and Rainfall, 2014 Annual Average Total Suspended Particulate, Sulphur Dioxide and Nitrogen Dioxide, Location of Dustfall and Meteorological Stations, and Wolverine Hair Snagging Stations into Section 4 2014 Report Submissions.
- De Beers replaced five pages of site photos without explanation with four photos showing the North Pile from 2011 to 2014, in Appendix A: Photographs.

De Beers adequately summarized the monitoring activities and results for 2014, and improved the report presentation. SLEMA believed the EAAR 2014 was satisfactory and sent the official comment letter out to ENR on March 25, 2016.

Water Licence

Snap Lake's Type "A" Water Licence MV2011L2-0004 was approved by the Minister of AANDC on May 23, 2012 following recommendation of the MVLWB. The licence is valid from June 14, 2012 to June 13, 2020.

2014 Water License Annual Report

The 2014 Water License Annual Report was submitted on March 31, 2015, with 4 Appendices:

- Geotechnical Monitoring Program Summary for the Period 1999-2014.
- Acid/Alkaline Rock Drainage and Geochemical Characterization Plan Adaptive Management Action Levels.
- Summary of September 2014 Geotechnical Site Inspection of North Pile Facility and Water Management Pond Dams.

- Acid/Alkaline Rock Drainage (ARD) and Geochemistry Characterization 2014 Annual Report.

SLEMA reviewed the above documents and provided comments to the MLWB on May 19, 2015.

- A few mistakes of data reporting were identified for Sections 7 and 8. Correction was requested.
- Section 17 does not report the SNP 02-18 data and the monthly average data for SNP 02-17B. Otherwise, the complete data reporting will support the understanding of the exceedance events of TDS and Chloride. It was recommended that Section 17 reports the SNP 02-18 data and the monthly average data for SNP 02-17B in future annual reports.
- No concerns were raised for all four Appendices. The analysis was satisfactory and report recommendations were supported.

Follow-up to Potential Exceedance at SNP 02-18 in January 2015

SLEMA updated its water quality model to predict whole lake average (SNP 02-18) of Total Dissolved Solids (TDS) in November 2014 and made a prediction as follows.

- *"Based the TDS prediction and the TDS exceedance in late winter of 2014, SLEMA believes that the whole lake average of TDS will exceed the water licence limit (350 mg/L) again in 2015 and in the ice-cover season of the following years."*

Then SLEMA requested De Beers to demonstrate its compliance on November 27, 2014. De Beers responded on December 15, 2014 that De Beers would attempt to conduct a sampling program in early January.

SLEMA analyzed the TDS data at SNP 02-20 from the January 2015 SNP Monthly Report and believed that TDS level at SNP 02-18 might exceed the current water licence limit of 350 mg/L. As a result, SLEMA, on March 2, 2015, requested an update on De Beers' attempt to conduct sampling in January and February 2015. De Beers responded on March 5, 2015 that cold weather resulted in the cancellation of sampling in January and February 2015, and next planned SNP 02-18 sampling would be conducted in May 2015 as required by Water Licence MV2011L2-0004.

SLEMA further analyzed the TDS data at SNP 02-20 from the February and March 2015 SNP Monthly Reports and was of the opinion that TDS level at SNP 02-18 may have exceeded the current water licence limit of 350 mg/L since January 2015.

In light of the above, SLEMA sent a letter to the Inspector on May 4, 2015, and recommended that the Inspector initiate an investigation to confirm De Beers' compliance to its water licence.

The Inspector responded on May 5, 2015 that

- *"I appreciate the recommendation from Mr. Weyallon, and will take it under advisement until the whole lake average sample data become available for review."*

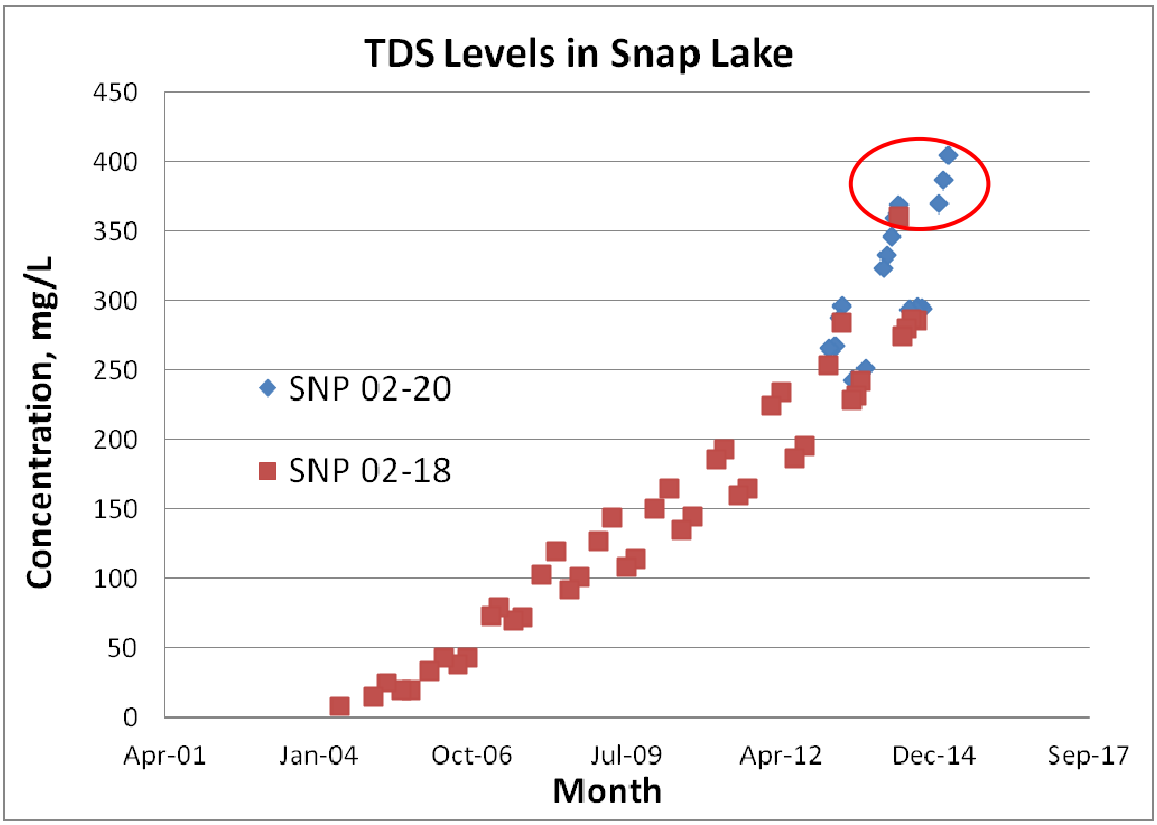


Figure 1. TDS Levels Measured in Snap Lake (updated in May 2015)

Ceriodaphnia Dubia Low Action Level Triggered – Context, Significance, and Recommendation

De Beers submitted the Ceriodaphnia Dubia Response Plan, titled Ceriodaphnia Dubia Low Action Level Triggered – Context, Significance, and Recommendation, on April 30, 2015.

In 2014, the water quality Low Action Level for toxicological impairment was triggered following observed effects on the waterflea Ceriodaphnia dubia (C. dubia) reproduction, and was confirmed in January 2015. C. dubia toxicity test results from treated effluent and diffuser station samples during 2005 to 2014 were reviewed in detail by De Beers. De Beers found out that:

- A lack of consistency between corresponding water chemistry and C. dubia toxicity (i.e., toxicity was not consistently associated with elevated contaminant concentrations such as TDS, nutrients, or metals—there were no correlations), and between results from individual diffuser stations.
- A lack of adverse effects on the function of zooplankton communities in Snap Lake, including waterfleas resident in the lake (C. dubia is not found in Snap Lake).
- Variability of C. dubia toxicity test data and the potential for false positive results (e.g., greater effects observed in the diluted diffuser station samples than in the full-strength treated effluent).

De Beers concluded that the C. dubia laboratory toxicity test results thus do not appear to be directly related either to contaminant concentrations in the treated effluent or to adverse effects on waterfleas, other zooplankton, or other biota in Snap Lake, and recommended that an assessment of the current Low Action Level relative to C. dubia test variability, including minimizing the potential for false positives without minimizing early warning of potential effects in the receiving environment, should be considered during the AEMP Design Plan Update in 2015.

SLEMA did not have comments at the time because the subject was beyond the expertise of the Environmental Analyst. ENR and EC provided valuable comments and recommendations on this matter.

2014 Hydrology Annual Report

De Beers submitted the 2014 Hydrology Annual Report on May 8, 2015. This report summarizes the 2014 water elevations and lake discharge trends at Snap Lake, North Lake, Northeast Lake, and 1999 Reference Lake. It also provides a summary of the 2014 Snap Lake water balance.

Monitoring results indicate that

- Over the period of September 2013 to September 2014, water elevations decreased at the 1999 Reference Lake, North Lake, and Northeast Lake by 56 mm, 78 mm, and 103 mm respectively. Water elevations decreased by 58 mm at Snap Lake.
- The Snap Lake water balance predicted a decrease in the water elevation of Snap Lake of 77.4 mm, whereas surveyed elevation changes from September 2013 to August 2014 were 58 mm. These differences may be due to uncertainty in the drainage area inflow data and the Snap Lake outflow data.

SELMA reviewed the document in May 2015 and provided the following comments.

- *"It is appreciated that De Beers presented three figures of water losses and water gains to and from Snap Lake, and complete site water balance to aid with water budget calculations.*
- *There are a few missing items or typo errors in Figures 4 and 5. Correction is requested."*

2014 Annual Closure and Reclamation Progress Report

ARKTIS Solutions Inc. (ARKTIS) was retained by De Beers to assist in the completion of the 2014 Annual Closure and Reclamation Plan Progress Report, and the Report was submitted on March 31, 2015. The objective of this annual report is to summarize the closure and reclamation activities conducted during 2014.

De Beers reported notable variances which occurred in 2014 to the original Project schedule outlined in the Consolidated Project Description (CPD) include:

- Delay of PK deposition in the underground mine workings.
- Deposition of PK as slurry into the North Pile rather than paste.
- Deviation from the initial North Pile development schedule.
- Site construction activities (i.e. Construction of new fuel tank area).

These variances have had significant implications to the Interim Closure and Reclamation Plan (ICRP), including:

- *"Continuous difficulties in the production of paste for deposition in the underground mine in previous years has meant that the all processed kimberlite production has been and will likely continue to be delivered to the North Pile.*
- *It is anticipated that selection of a desired option for expansion of the North Pile will occur in Q3 of 2015, which will allow deposition of PK within the North Pile until the projected end of mining date, 2028.*
- *Revised timelines for the completion of progressive reclamation efforts at the Starter Cell and East Cell will be developed following confirmation of the desired approach for North Pile expansion (e.g. increased height, increased footprint, or combination of each).*
- *The increased size of the North Pile is not expected to require changes to the framework of the existing closure design (i.e. closure objectives, criteria, activities). However, the planned closure activities (i.e. placement of a rock cover) will require corresponding increases in the estimated timelines for completing work."*

The majority of the site infrastructure is required for mining operations until closure, which limits the number of prospective facilities that can be reclaimed before the end of the planned life of mine. This is primarily due to the exclusively underground mining activities at Snap Lake and relatively small footprint compared to nearby diamond mines. As a result, De Beers only made limited reclamation progress at the mine site in 2014.

- No further reclamation activities at the former AN Storage Pad were completed in 2014. The excavation site was proposed to support future revegetation field trials as part of its reclamation.
- Development of a conceptual Rock Cover Design Report was done in 2013. Advancement of a Starter Cell cover options analysis and rock cover design to 50% design phase was completed.
- A detailed reclamation plan for the South Pit area was developed in 2014. Limitations in available site ressources resulted in this progressive reclamation work being postponed.
- In 2014 a sampling and geochemical investigation plan was developed for sediments deposited within the Water Management Pond and North Pile sumps and ditches in order to evaluate the degree of contamination present and assess if any stabilization or disposal measures are required.

The purpose of reclamation research is to address uncertainty in the engineering and environmental elements regarding closure, obtain information that can lead to the development

of appropriate closure criteria, and allow the ICRP to be continuously refined. De Beers made progress in the Seed Development Research Project in 2014 and established a list of candidate species for use in revegetation at Snap Lake.

MVLWB approval of ICRP Version 3.2 was received on January 30, 2014. Reviewer comments included several recommended additions and modifications to the ICRP that were agreed upon by De Beers and will be included within the next ICRP revision, which is due for submission to the MVLWB by January 30, 2017.

The total security held at the end of 2014 was $76,796,701.

SLEMA reviewed the Report, and did not raise any concerns.

During the site visit and following TK Workshop on June 24 and 25, 2015, TK Panel members made comments related to revegetation and closure.

- *"Let nature take its course, let it re-vegetate naturally. No fertilizer should be applied.*
- *The size of crush will dictate what type of plant may grow.*
- *Don't go planting, take all the man made stuff away.*
- *Birds will spread the seeds. No help required.*
- *In future grass will grow.*
- *If human plant the seeds it will cause more harm.*
- *When disturbance is gone grass will grow by itself.*
- *Willows will grow from cuttings.*
- *Lichen will come back but it needs to be there first.*
- *Lichen does not grow on small rocks. Grass and trees will grow in low areas.*
- *On the tundra, at one time there were no trees, but lichen grew everywhere, this is like north of Snap Lake.*
- *All the plants are medicinal.*
- *Climate change brings plants not here before."*

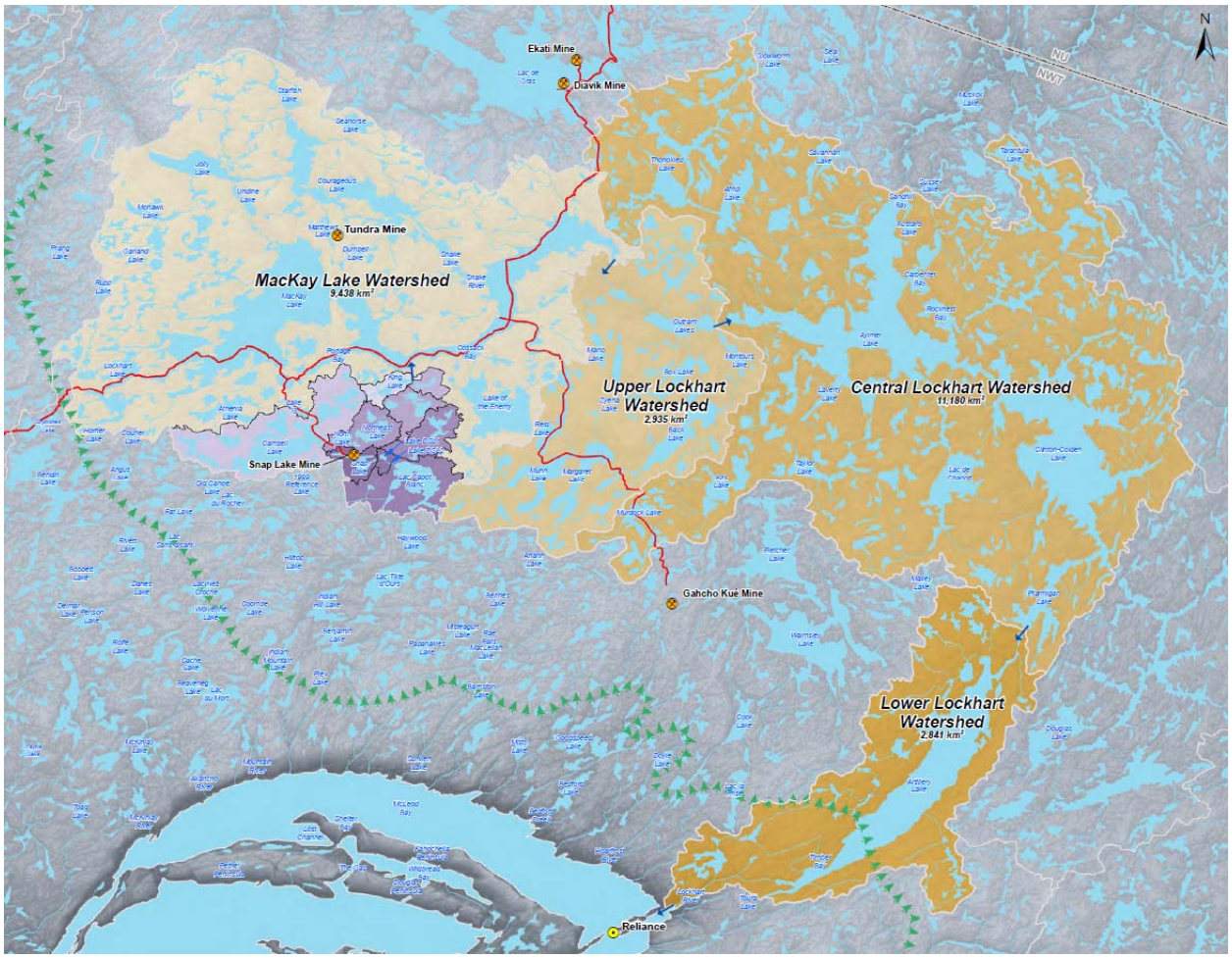
Downstream Water Courses Special Study Plan

De Beers submitted the Plan on June 3, 2015 to fulfill the requirement from the Water Licence MV2011L2-0004, effective on May 5, 2015. It was designed to incorporate the water quality monitoring as part of the existing Downstream Lakes Special Study under the AEMP.

The purpose is to answer the following questions:

- What is the range of **natural variability** downstream of Snap Lake including MacKay Lake?
- What is the appropriate location(s) for monitoring downstream of Snap Lake?
- How will monitoring information be used to assess conformity with Measure 1(d) of the EA1314-02?

- *"No Total Dissolved Solids or its constituent ions from Snap Lake Mine effluent will be detectable, relative to the range of natural variability, at the inlet to MacKay Lake, 44 km downstream of Snap Lake*."



Map 2. MacKay Lake and Lockhart River Watershed

There will be two-year field study with up to five seasons (Freshet, Spring, Summer, Fall, Under-ice), and water quality and hydrological data will be monitored both on and off the potential flow path of the Snap Lake Mine treated effluent.

SLEMA reviewed the Plan and made the following comments on June 30, 2015.

- *"De Beers proposed 4 new "on the flow path" monitoring stations and 3 new "the flow path" monitoring stations, with current AEMP monitoring stations and 3 GNWT monitoring stations overlapped. It is a reasonable design.*
- *It is stated that water quality data from GNWT monitoring stations in King and MacKay lakes will also be used in the Plan (Section 2.2, page 8). However, there is no further discussion on streamlining the monitoring schedule and parameters. Related information is requested."*

2014 AEMP Annual Report

The Annual Report was submitted on May 1, 2015. The goal of the AEMP is to address potential Mine-related effects to the aquatic ecosystem of Snap Lake in a scientifically defensible manner. The Annual Report summarizes the monitoring results in 2014.

The core programs of the AEMP, completed every year, are: monitoring of water quality, plankton (the small plants and animals that live in the water), and sediment quality. Other components, which are completed every three years, were not conducted in 2014, including: benthic invertebrates (the small animals living in the mud of the lake bottom), fish community monitoring, tissue chemistry, and fish health. Three Special Studies were completed in 2014: the Littoral Zone Special Study, the Picoplankton Special Study, and the Downstream Lakes Special Study. AEMP monitoring results are briefly summarized as follow.

Water Quality

- In 2014, the annual treated effluent volume was approximately 18 percent higher than in 2013.
- Concentrations of total dissolved solids (TDS, dissolved salts in the water), nutrients (specifically nitrogen), and some metals have increased in Snap Lake from the discharge of treated effluent.
    - However, increases in these parameters were accompanied by increased hardness, which is a parameter that reduces the toxicity of those parameters.
- Concentrations of TDS were above the current Water Licence limit (350 milligrams per litre) in May 2014, but a request to increase this limit inclusive of chloride was being considered by the MVLWB.
- Laboratory toxicity tests were performed exposing algae, water fleas, and fish to both treated effluent from the Mine and the water near the treated effluent discharge to Snap Lake
    - Neither the treated effluent nor the lake water was toxic to algae or fish.
    - Although the waterfleas survived in all tests, some samples of both treated effluent and lake water reduced the reproduction of one of the species, Ceriodaphnia dubia.
- The changes to water quality in Snap Lake do not pose a human health risk, have not adversely affected the drinkability of the water, and are not expected to cause adverse effects to resident aquatic life.

SLEMA reviewed the Water Quality section, and did not raise any concerns.

Sediment Quality

- The results of the 2014 monitoring indicated that concentrations of available potassium, available sulphate, antimony, calcium, mercury, selenium, silver, sodium, and strontium at the diffuser station are potentially being influenced by Mine operations. However, it is

unlikely that these changes resulted in adverse environmental effects; the changes were not large enough that such effects would be expected.

Plankton

- Small changes were occurring in the plankton community of Snap Lake and will occur in future due to the Mine and/or natural factors. However, these changes had not adversely affected this important component of the food chain for fish; the plankton community in Snap Lake remained healthy.
    - Since 2011, the number of phytoplankton has increased in the northwest arm, but decreased in the main basin. Changes to the types of phytoplankton in Snap Lake since 2004 had not affected the food chain leading to fish.
    - The zooplankton in Snap Lake had decreased in numbers from 2004 to 2014, and the types of zooplankton within Snap Lake had changed since 2012.

Littoral Zone Special Study

- The littoral zone is the shallow near-shore area of a lake.
- The Littoral Zone Special Study showed that the littoral zone of Snap Lake had not been negatively affected by the Mine; rather, the food quality of the algae and the amount of algae available for the littoral small animal grazers had improved since the Mine started operating. Thus, the food supply for fish had increased.

Picoplankton Special Study

- The changes observed in the picoplankton (very small plants and animals in the water) community in the main part of Snap Lake (the main basin) were subtle and did not indicate a strong effect from the Mine. The changes in the northwest arm of Snap Lake, less affected by treated effluent, were greater than in the main basin. Other factors, such as changes to the regional environment and changes in predator grazing over time may be affecting the picoplankton community. Changes to the picoplankton and phytoplankton in the main basin of Snap Lake were not affecting the food chain upon which fish rely.

Downstream Lakes Special Study

- Three downstream lakes are Downstream Lake 1 (DSL1), Downstream Lake 2 (DSL2), and Lac Capot Blanc (LCB).
- Evidence of the treated effluent was detected throughout DSL1 and DSL2, less so in LCB in 2014.
    - As predicted, there was evidence of low concentrations of treated effluent at the outlet of LCB in 2014.

Weight of Evidence Integration

- In 2014, compared to previous years, there was a much weaker link between nutrient releases to Snap Lake as a result of Mine activities and enhancement of the phytoplankton community. Phytoplankton biomass (the amount of food available in the

food chain leading to fish) and community structure in Snap Lake had returned to conditions similar to those observed pre-mining. There were subtle changes in the zooplankton (small animals living in the water), which could have resulted from toxicity but could also have resulted from more food for them from the phytoplankton or from greater feeding on them by fish. Although laboratory toxicity testing showed instances where the reproduction of waterfleas that do not live in Snap Lake was affected, the waterfleas that actually live in Snap Lake increased in numbers and biomass in the lake. There was no evidence of adverse effects to the structure and function of the Snap Lake ecosystem.

Report Conclusions

- Treated effluent discharge from the Mine was increasing and, as a result, changes in Snap Lake water and sediment quality were occurring. Treated effluent can be found in the two lakes immediately downstream of Snap Lake and, to a lesser extent, in LCB, the third downstream lake.
- Changes continued to occur in the Snap Lake plankton. However, these changes had not adversely affected the food chain upon which fish depend on; there was evidence for positive enhancement of this food chain, particularly in the shallow areas of Snap Lake.
- The small plant and animal communities in Snap Lake, which support the fish in the lake, were healthy and the water was safe to drink. Based on Aboriginal community members who tasted fish caught in Snap Lake, the fish were healthy

Proposed Amendments to the Response Framework for the North Pile Facility and Water Management Pond Dams

Nitrate levels at the discharge from the North Pile (location SNP 02-02) were above the Response Framework threshold criteria of 44 mg/L in 2014, triggering an Orange (high risk situation) response. De Beers conducted data review, which indicated values at the site discharge location (SNP 02-17B) continue to remain within water licence limits.

Given that the observed concentrations at location SNP 02-02 were unlikely to cause an upset to site operations, De Beers proposed to revise the threshold criteria at SNP 02-02, on May 29, 2016.

SLEMA reviewed the proposal and made the following comments in July 9, 2015.

- Nitrate levels at SNP 02-17B were lower than 14 mg/L. It is impossible to trigger any of the proposed thresholds for SNP 02-17B.
- The threshold for the emergency situation at SNP02-17B may not be appropriate.
    - Greater than 100% of the Maximum Average EQC limit (22 mg/L) means non-compliance, which should be prevented from.
    - It is recommended that the Red threshold be set at greater than 90% of the Maximum Average EQC limit (22 mg/L).
- The two proposed trigger level values for SNP 02-02 are appropriate.

- For the past few years, there are only four grab sample with nitrate levels above the proposed Yellow threshold (200 mg/L), and two years (2010 and 2012) with Annual Average nitrate levels above Orange threshold (120 mg/L).

Report on Correlation between On-Site and Laboratory Measurements of Chloride and TDS

De Beers installed on-site (in-line) chloride meter to help manage effluent quality at Snap Lake Mine. However, after comparing the historical instrument measurements of in-line chloride to laboratory analyses, De Beers concluded that on-site (in-line) chloride measurements were unreliable, and that in-line electrical conductivity provided much more reliable operational monitoring data.

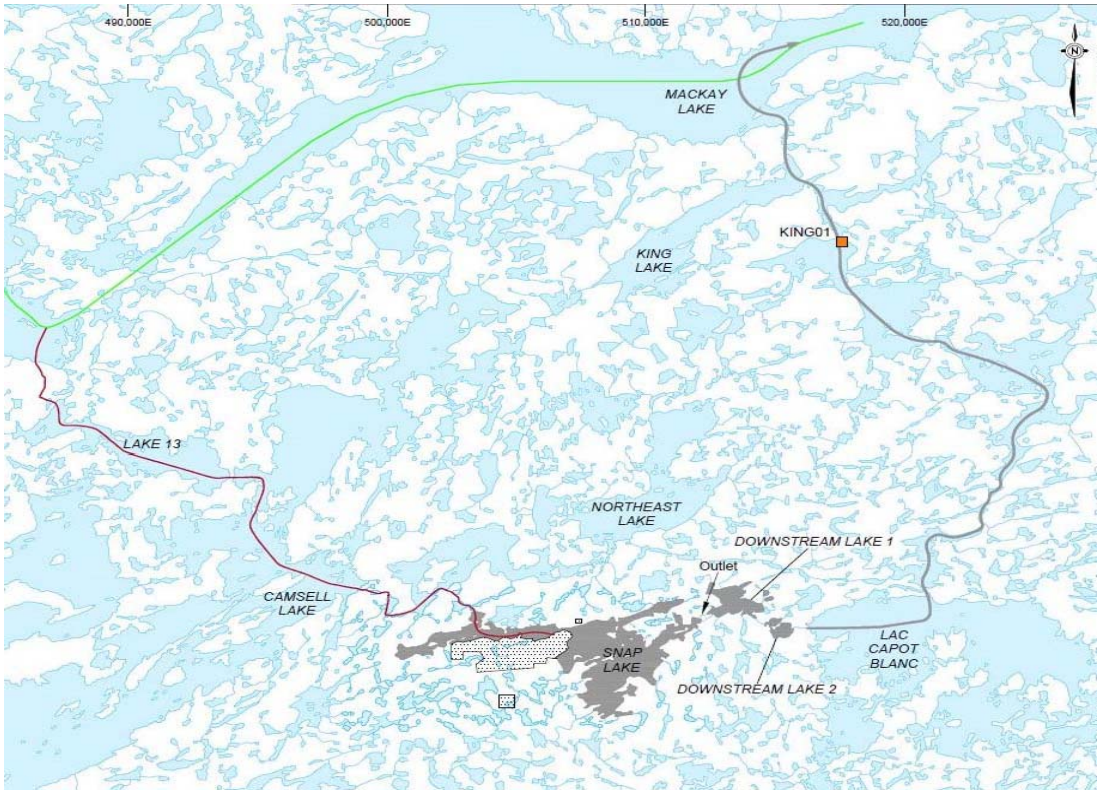
As a result, De Beers requested, on September 24, 2015, that the Board approve a change to the requirements for sampling and reporting daily in-house chloride per Annex A; Part A.1; SNP 02-17b *from "daily on-site in-house chloride", to "daily, on-site, in-line electrical conductivity"*.

SLEMA reviewed the Request and the associated data analysis on October 9, 2015, and supported De Beers' request.

AEMP Design Plan Update

The original Aquatic Effects Monitoring Program (AEMP) for the Snap Lake Mine (Mine) was implemented in 2005 and updated in 2013.

De Beers submitted the 2015 AEMP Design Plan on October 30, 2015. The Plan provides refinements, not major changes. For example, the toxicity assessment will be a separate AEMP component, rather than being reported as part of the water quality component. Major changes might be possible in 2017 while De Beers submits the AEMP Re-evaluation Report and AEMP Design Update on November 1, 2017.



Map 3. Zone of Influence of Snap Lake Mine and Study Area of the AEMP

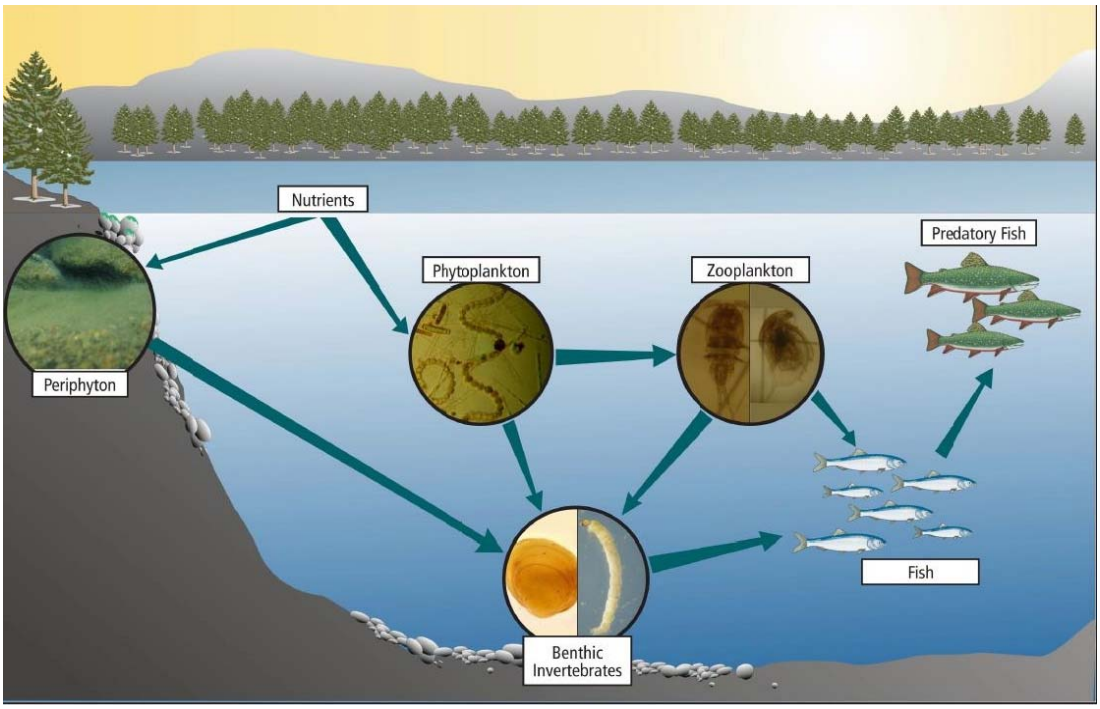


Figure 2. Concept Site Model of the AEMP

Based on the most recent Water Licence amendment, the 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.

SLEMA did not have concerns with the 2015 AEMP Design Plan.

Due to the suspension of the mine operations on December 4, 2015, MVLWB delayed the review until further notice on December 14, 2015.

Waste Management Plan

The Waste Management Plan was submitted on October 8, 2015. This is an update from the January 2014 version. The update includes:

- "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, and
- Fuel capacity volume was updated.

SLEMA reviewed the Waste Management Plan in October 2015, and provided the following comments via e-mail to De Beers.

- *"In the 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."*

Quarterly TDS Mitigation Implementation Reports

The amended Water Licence requires De Beers to submit a summary of TDS mitigation research and schedule of mitigation measures implementation on a quarterly basis. De Beers submitted the Quarterly Reports on October 30, 2015 and January 25, 2016.

De Beers initiated a BATEA (Best Available Technology Economically Achievable) study for reduction of TDS loading at Snap Lake in July 2014. Reverse Osmosis technology was identified as the most promising long term solution for reducing TDS loading in effluent at Snap Lake Mine.

A proof of concept (Phase I) unit was 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 was procured in September 2015, and was due to be delivered to the Mine along the winter road in 2016.

Due to operation suspension since December 4, 2015, the intended installation of the RO plant would not take place in 2016. All progress on TDS mitigation implementation at Snap Lake Mine has been on hold.

SLEMA reviewed these two Quarterly Reports, and did not raise any concerns.

- *"Currently effluent discharge limits could be manageable without additional mitigation."*

2015 Geotechnical Inspection of North Pile and WMP Dams

De Beers conducted the annual Geotechnical field inspection through Norwest Corporation from August 31 to September 3, 2015. Additionally, De Beers conducted the annual Geochemical field inspection through Golder Associates on September 15 to 16, 2015. The Report was submitted on November 9, 2015.

Geotechnical Inspection

Norwest Corporation carried out "audit type" of review, which was intended to review the currency and adequacy of all of the safety management arrangements in place for a dam on the basis of documentation, site reviews, interviews with operating staff and preliminary engineering analysis.

After site visit and data analysis, the Norwest geotechnical engineer made the following conclusions and recommendations.

- The embankments designs generally conformed to industry norms.
  - An extensive area of upstream slumping had occurred along Cells 2 and 3. Consequently, there was an immediate requirement to revise design/construction procedures for upstream raising of the East Cell Main Embankment.
  - The containment dikes for both facilities sloped towards the east and there was about 2m of freeboard in the Starter Cell during the site visit. There was a need to evaluate the impact of a rib berm breach during a large storm and its impact on available freeboard in the East end of the Starter Cell.
- Construction and operation of the tailings facility generally met standards of practice.
  - There was a need for cold weather compaction procedures scaled to temperature conditions and incorporating a method specification.
  - There was a need to finalize the OMS document in a timely fashion.
  - There was a need for annual as-built construction reports which include as-built drawings, notes on construction quality control, variances from design, and relevant monitoring information.

- A paired system of thermistors and piezometers (sealed VWP type) should be installed along the crest at key locations, primarily to measure pore pressures on the downstream side of the embankments. Key areas to be included: East Cell Main Embankment, Rib Berm 1, and Starter Cell West Embankment.
- Extending the survey prism monitoring system to Rib Berm 1 and the Starter Cell North Embankment.
- Regular slope surveillance mapping to identify cracks, slumps, seeps, and other performance indicators.

Geochemical Inspection

The objectives of the annual geochemical site inspection are to confirm material placement following construction activities on surface at the Mine; to identify signs of incipient acid generation; and to identify potential environmental concerns associated with acid rock drainage or metal leaching.

Golder geochemist conducted a seepage survey of the main facilities and collected a total of 20 supplemental geochemical grab samples during the geochemical site inspection. The conclusions and recommendations are as follows.

- All locations inspected continued to show no signs of incipient acid generation or ARD.
- If possible, given the consistent results in annual inspections it was recommended that the geochemistry inspection frequency be reduced to bi-annually (every two years).
- Samples of standing water should be collected from the two locations identified adjacent to the access road constructed north of the West Cell area. These samples should be compared to known baseline conditions for Bog Waters prior to placement of material in the West Cell of the North Pile.
- Results of water monitoring would be reviewed and updated in the Annual ARD Report. Water quality samples should continue to be collected from existing locations to evaluate the composition of non-point source runoff to Snap Lake.

SLEMA reviewed the Report, did not raise any concerns, and supported all of the recommendations.

Hazardous Waste Containment Facilities Final Design

De Beers intended to construct a Hazardous Waste Containment Facility (HWCF) in two parts, as a modification of the Waste Management Area (HWCF-Area A), and temporary laydown (HWCF-Area B) at Snap Lake Mine. This modification would allow De Beers to decommission the inactive Landfarm located within the West Cell of the North Pile, and facilitate the ongoing management of hydrocarbon contaminated material and other hazardous wastes on site in accordance with the Waste Management Plan. De Beers submitted the Design Report on November 17, 2015.

Based on the preliminary results of a sampling program that was performed by De Beers to delineate the extents of potentially impacted soils within the existing landfarm, it was estimated by De Beers that a facility to store up to 14,000 m^3 of impacted soils would be required. The impacted soils would be staged within two new HWCFs until further management of these materials is completed.

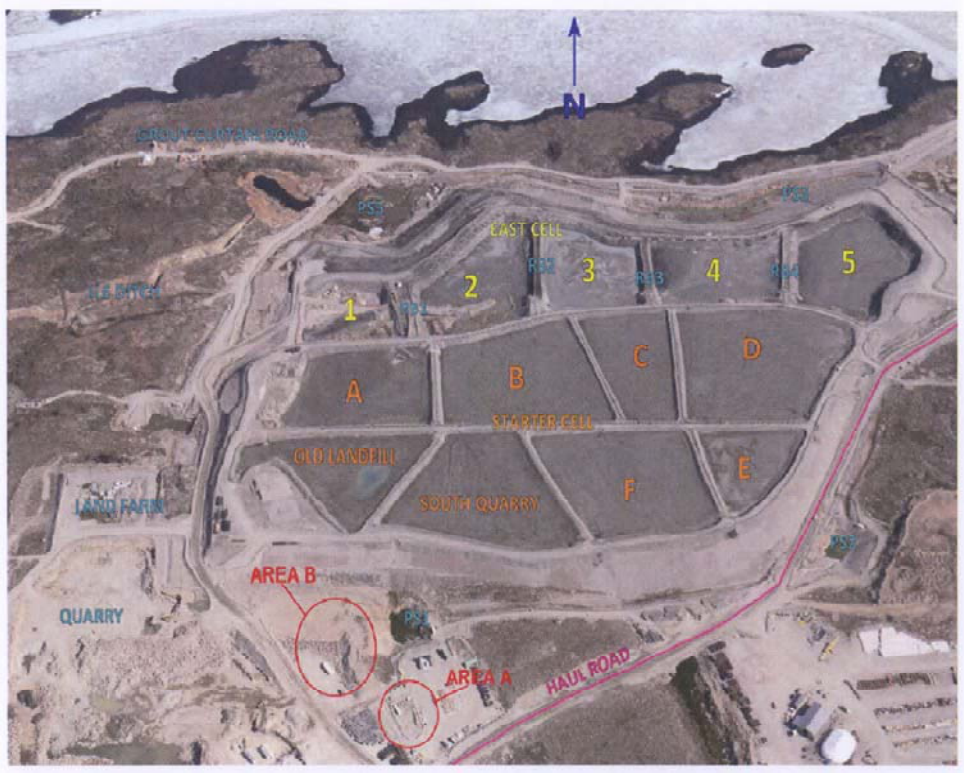


Photo 10. Site Layout – Existing Landfarm, Area A and Area B

Both HWCFs (Area A and Area B) are bermed and lined containment area. The Area A and B facilities have not been designed to contain seasonal water accumulation due to precipitation events. As such, snow removal and water accumulation from precipitation is considered a maintenance item to be managed by De Beers according to the existing Snap Lake Waste Management Plan.

SLEMA reviewed the Design. No major concerns were raised.

- *"The assessment for potential contamination and/or remediation of existing landfarm is requested.*
- *It is requested that De Beers submit the Operations Plan as soon as possible and clarify the operational flexibility of the new HWCFs."*

2015 Downstream Watercourses Water Quality Model

Updating the water quantity and quality predictions downstream of Snap Lake through the Lockhart River system and into MacKay Lake is a requirement of the Water Licence amended in September 2015. De Beers submitted the modeling results on December 24, 2015, and stated that:

- *"De Beers notes that on December 4 2015, notification was provided to the Board that Snap Lake Mine had suspended mining operations. De Beers will no longer achieve the concentrations or volumes of effluent predicted in this model as it is based upon an operating mine. On this basis, certain aspects may no longer be applicable or appropriate. Upon resuming operations, an updated downstream lakes water quality model may be applicable based upon future conditions of Snap Lake and as such, De Beers considers* ***this model report to be for information purposes only****."*

De Beers concluded from the modeling results that:

- Concentrations of calculated TDS were predicted to range from 770 mg/L to 864 mg/L at the Snap Lake outlet in 2028. As water travelled from the outlet of Snap Lake through Lac Capot Blanc and the Lockhart River system, constituent concentrations were predicted to decrease. At Node 22 in MacKay Lake, calculated TDS concentrations were predicted to range from 24 mg/L to 26 mg/L (i.e., a reduction in concentrations of TDS of 97% from the Snap Lake outlet).
- Similarly, concentrations of chloride were predicted to range from 360 mg/L to 405 mg/L at the Snap Lake outlet in 2028. At Node 22 in MacKay Lake, chloride concentrations were predicted to range from 7.4 mg/L to 8.5 mg/L (i.e., a reduction in concentrations of chloride of 98% from the Snap Lake outlet).
- Similar reductions in concentrations were predicted for all model constituents.

SELMA reviewed the Report and believed it was satisfactory.

Community Engagement Plan

De Beers submitted the Community Engagement Plan on March 1, 2016. This plan describes the methods by which De Beers will undertake Engagement on key topics related to the water licence and land use permits.

The guiding principles of De Beers' engagement are Respectful, Timely, Informative, Comprehensive, Ongoing, and Responsive. The engagement process and activities are as follows.

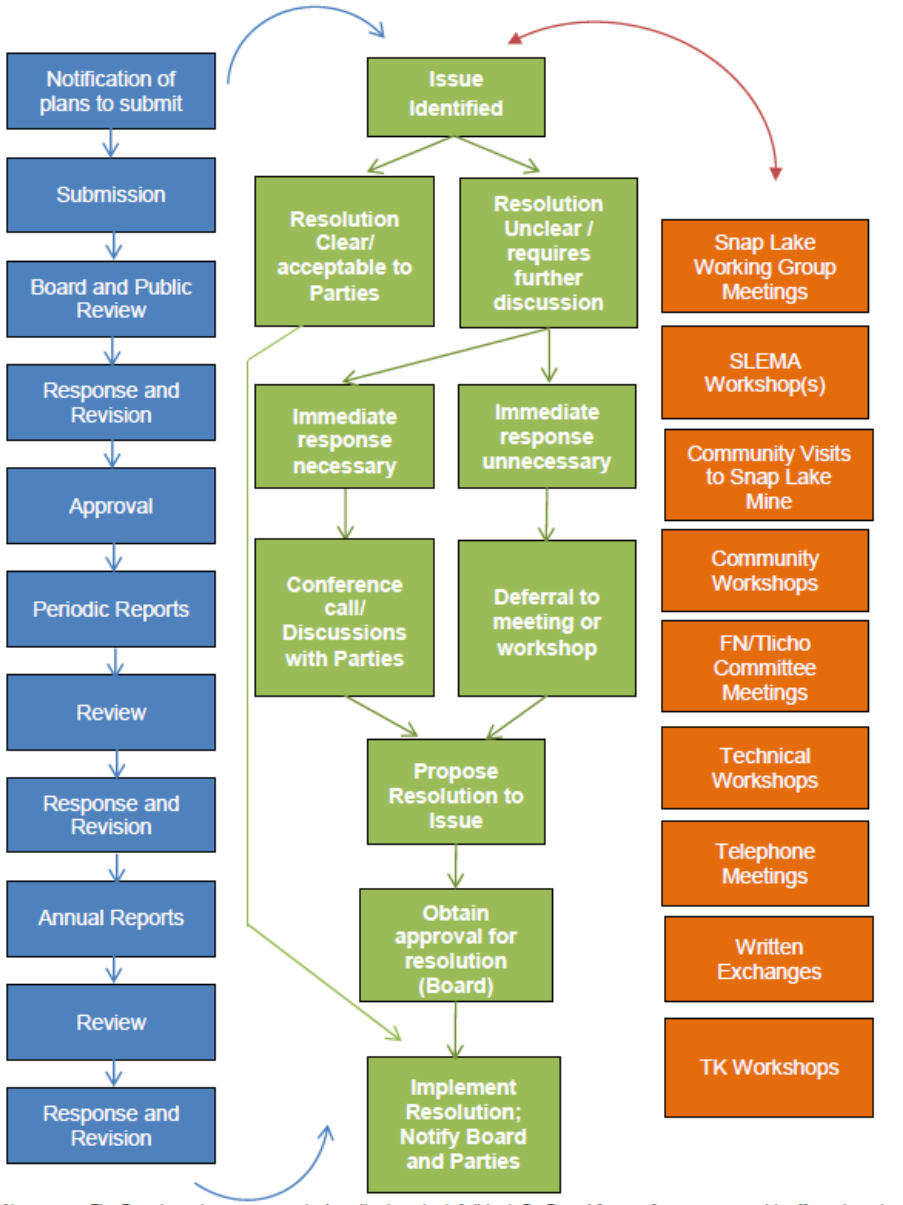


Figure 3. De Beers Engagement Process

SLEMA reviewed the Plan and did not have any concerns.

North Pile Development

Development of the North Pile represents the vast majority of remaining project activities on surface at the project site.

- Deposition of PK and waste rock in the East Cell began in 2012 and was projected to continue through 2015 until January 2016
- The initial phase of Phase I West Cell was expected to be available for tailings deposition in January 2016 and it is design to store sufficient coarse and fine PK and mine waste rock produced by the mine until 2021/2022

De Beers commenced the construction activities associated with the West Cell in November 2014. Since December 2015, the West Cell construction activities have been on hold due to the mine being placed into care and maintenance.

During the site visit and following TK Workshop on June 24 and 25, 2015, TK Panel members made comments related to the North Pile development, especially the concerns on the North Pile expansion.

- *"How high are other piles? (De Beers: for example, EKATI has one pile at 40 m, Gahcho Kue at 120 m, Cantung up to 500m.) Then why do we have to limit the height? They should all be the same.*
- *A higher pile concentrates the area of impacts.*
- *Higher is smaller footprint, don't understand the rationale for considering making it wider.*
- *Need to have caribou access to let them go up.*
- *Do the slopes (make the slope less steep).*
- *Change the direction to divert water to land at closure to create a filter to the water. The longer the water is on the land the better the buffer.*
- *The higher the pile, means less area for seepage, more easily managed if it is smaller – fewer sumps.*
- *If built higher more likely to attract caribou.*
- *Ideally ramps could be built for caribou out of till or crushed gravel. Caribou ramps with finer material are preferred to access the other side.*
- *It is suggested that higher would be preferred."*

TK Panel members also made comments related to their expectation of mine closure.

- *"It would be beneficial to do progressive reclamation.*
- *Avoid boulders on side slopes, it should look like the surrounding landscape.*
- *3:1 is more conducive to revegetation.*
- *It is good to fill in the holes (like sumps) and make it smoother.*
- *Re-contour the land to its original state.*
- *It takes time but it will come back.*
- *Fix it and smooth it flat, then the Elders can go camping on the waste rock pile.*
- *The rock pile need to settle down and harden and then the caribou will go up.*
- *Disturbance to the land is huge. Piling of waste rock should not be too high."*

Water Licence Amendment Applications

De Beers submitted an Amendment Application to the MVLWB requesting seventeen changes to the terms and conditions of Water licence MV2011L2-0004 in December 2013. Further in November 2014, De Beers submitted a second (additional) Application to amend Water Licence MV2011L2-0004.

November 2014 Amendment Application

The MVLWB completed it regulatory process for the November 2014 Amendment Application of Water Licence MV2011L2-0004 on March 30, 2015. On May 4, 2015, under subsection 37 of the *Waters Act and 72.13 of the Mackenzie Valley Resource Management Act* as delegated under *Schedule A of the Delegation* Instrument, the Minister of Environment and Natural Resources, Government of the Northwest Territories approved the amendment as De Beers applied for on November 12, 2014. The MVLWB issued the amended Water Licence on May 5, 2015.

On March 30, 2015, the MVLWB also circulated a draft Water Licence for the December 2013 Amendment Application to parties for review.

SLEMA Comments on Draft Water Licence for the December 2013 Amendment Application

SLEMA commented the draft Water Licence for the December 2013 Amendment Application on April 13, 2015.

The MVLWB granted De Beers requests on EQCs and required quarterly Total Dissolved Solids Mitigation Implementation Report and special study of the downstream watercourses.

- Measures 1 and 2 of EA1314-02 are reflected in conditions set out in the Water Licence.
- Suggestions 1 and 3 of EA1314-02 are reflected in conditions set out in the Water Licence.
- **Suggestion 2 of EA1314-02 is not reflected in conditions set out in the Water Licence.**

Suggestion 2 of EA1314-02 reads:

> *"The Mackenzie Valley Land and Water Board should set closure objectives and criteria that ensure drinking water quality in Snap Lake achieves the Health Canada Guidelines for Canadian Drinking Water Quality aesthetic objective for TDS in drinking water within five years of the end of mining operations."*

SLEMA recommended that the MVLWB add related conditions into Part I. Conditions Applying to Closure and Reclamation.

TDS is not well defined in the Water Licence. SLEMA believed that:

- *"TDS calculated is great for management purpose, because it is directly related to the mine impacts.*
- *TDS measured may be better while compared with Drinking Water Guideline aesthetic objective (500 mg/L)."*

SLEMA recommended that the MVLWB clearly define TDS in Part A. Scope and Definitions, and require De Beers to report both TDS calculated and TDS measured for SNP 02-15, SNP 02-17B, SNP 02-18 and SNP 02-20.

December 2013 Amendment Application

The MVLWB completed its regulatory process for the amendment of the De Beers Canada Inc. Type A Water Licence MV2011L2-0004 for the Snap Lake Mine, at Snap Lake, NT, submitted December 20, 2013. On June 8, 2015, a motion was passed by the MVLWB Board to forward the amended Water Licence and Reasons for Decision to the ENR Minister for his approval.

The MVLWB sent the amended Water Licence MV2011L2-0004 and *Reasons for Decision* to the ENR Minister for his approval on June 19, 2015. The ENR Minister approved the amended Water Licence recommended by the MVLWB on September 10, 2015.

The MVLWB accepted De Beers proposed EQCs with minor modifications.

Table 1. Amended EQCs for Water Licence MV2011L2-0004

Parameter	EQC (mg/L)		Average Annual Loading Limit (kg/yr)
	Maximum Average Concentration	Maximum Grab Concentration	
Total Dissolved Solids (TDS) (calculated)	960	1253	n/a
Total Suspended Sediments	7	14	n/a
Ammonia as N	10	20	208,000
Nitrite as N	0.35	0.6	n/a
Nitrate as N	12	17	250,000
Total Phosphorous	n/a	n/a	229
Fluoride	1.3	2.0	n/a
Total Aluminum	0.1	0.2	n/a
Total Arsenic	0.003	0.01	n/a
Total Chromium	0.01	0.02	n/a
Total Copper	0.003	0.006	n/a
Total Lead	0.005	0.01	n/a
Total Nickel	0.05	0.1	n/a
Total Zinc	0.01	0.02	n/a
Extractable Petroleum Hydrocarbons – F1 Fraction (C6-C10)	4.6	n/a	n/a
Extractable Petroleum Hydrocarbons – F2 Fraction (C11-C16)	2.1	n/a	n/a
Faecal Coliforms	10 CFU/100mL*	20 CFU/100mL*	n/a

* CFU - Colony-forming units

In response to SLEMA's comments on the draft Water Licence, the MVLWB states in the *Reasons for Decision*:

Suggestion 2 from EA1314-02

- *"The Board notes that the Review Board did not make this matter a measure in the Report of EA. No specific evidence was presented during this regulatory process to demonstrate that the suggestion would even be achievable. The Board does not customarily incorporate closure objectives or criteria into enforceable conditions of Licences. Through monitoring program data and modelling updates, all parties will gain more insight into what is achievable as the Project proceeds. As such, the Board will be in better position to provide direction on this matter through the iterative closure and reclamation planning process."*

Definition of TDS

- *"In its comments on the draft Licence, SLEMA recommended that the Board establish a definition for TDS in order to clarify whether TDS must be measured or calculated. De Beers agreed with SLEMA and proposed to define TDS as the sum of its constituent ions, using the equation set out in its intervention. The Board agrees that clarification is required and has accepted the equation proposed by De Beers for calculating TDS; however, the Board does not agree that defining TDS in Part A would add clarity to the Licence conditions, since SLEMA also recommended that measured TDS be reported at some monitoring stations. Having reviewed the conditions of the Licence, the Board has determined that it is more appropriate to set out the TDS calculation in the Surveillance Network Program (SNP), indicate whether measured or calculated TDS is required at each SNP station where TDS is monitored, and specify that the TDS EQC in Part F, item 8 is based on calculated TDS."*

SLEMA Modeling Update – Post Water Licence Amendment Applications

SLEMA updated the water quality model for Total Dissolved Solids (TDS) in June 2015 after De Beers received the interim EQCs in the amended Water Licence.

TDS modeling back test, with data up to April 2015, indicated that the correlation coefficient of the two data sets (observed values and modeling results) is 0.997, and confirmed the model capable of predicting future whole lake average of TDS concentrations in Snap Lake (SNP 02-18).

Back test results also indicate that TDS levels in Snap Lake may have been above 350 mg/L since January 2015. Technically, from January to April 2015, De Beers might be non-compliant against the Water Licence at SNP 02-18. De Beers had the interim EQCs accepted by the ENR Minister on May 5, 2015, and since then, De Beers have not had compliance problems associated with TDS.

Table 2. Back Tested TDS Levels in Snap Lake

TDS in mg/L at Stations	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015
SNP 02-18, predicted	338.8	**354.6**	**364.6**	**375.2**	**386.4**	390.8
SNP 02-20, observed		370.0	386.8	404.5	429.5	427.4

Two scenarios proposed by De Beers (simplified) and one conservative scenario proposed by SLEMA were applied into SLEMA TDS Model in order to predict the water quality in Snap Lake for the remaining mining life.

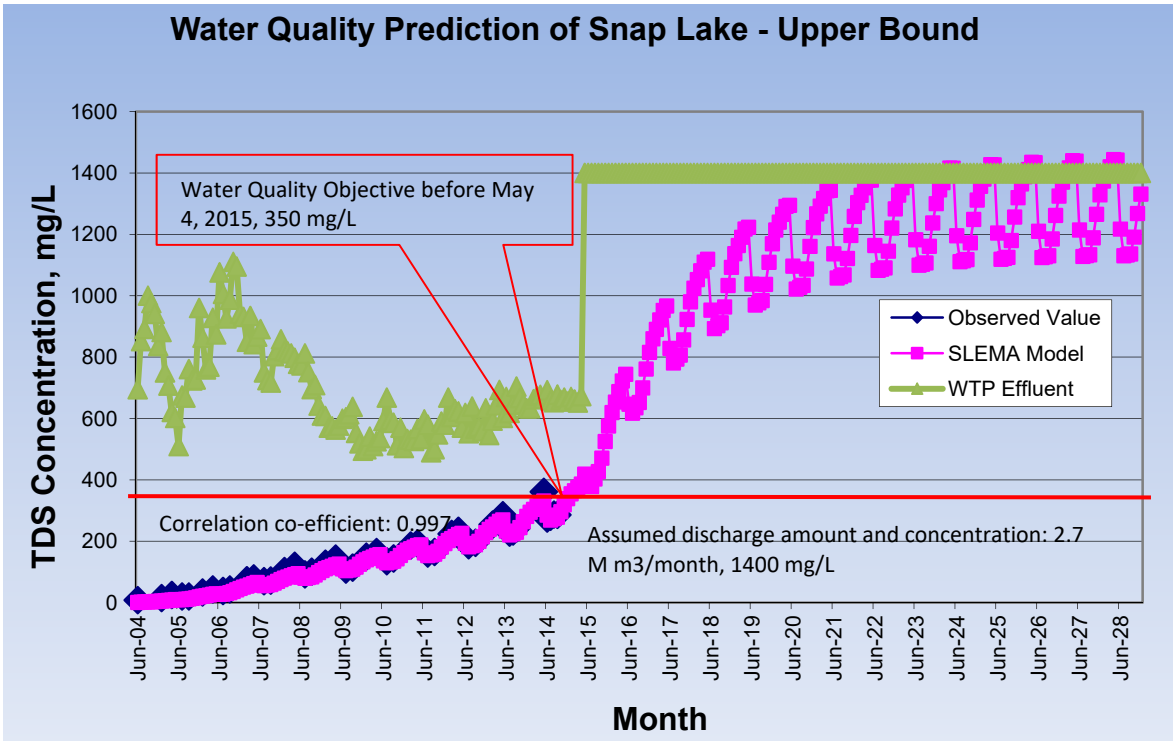


Figure 4. Prediction under De Beers' Upper Bound Assumption

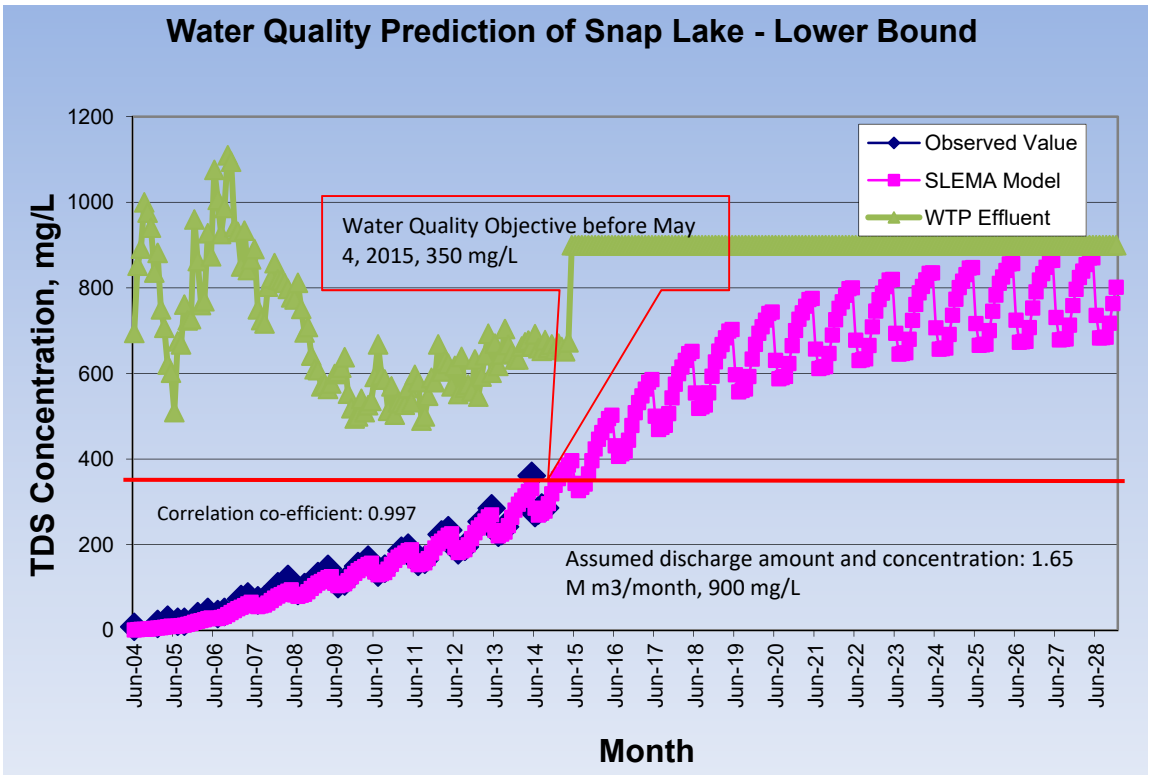


Figure 5. Prediction under De Beers' Lower Bound Assumption

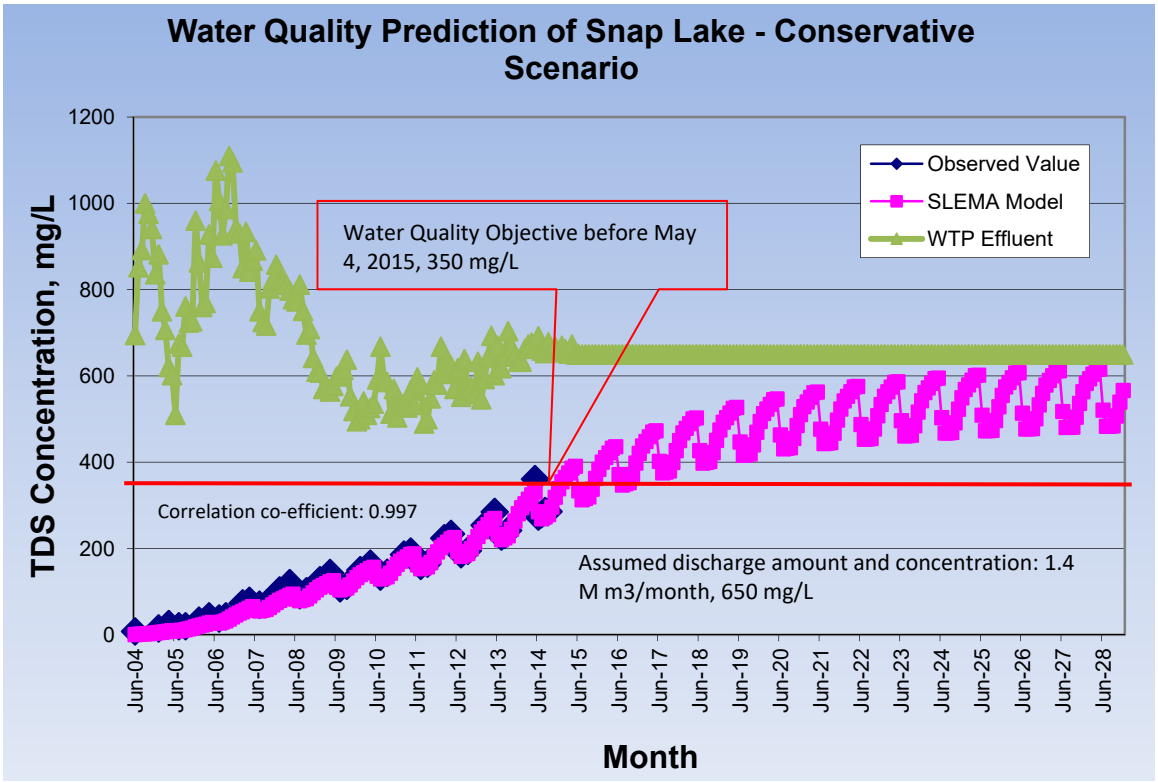


Figure 6. Prediction under SLEMA's Conservative Assumption

Modeling results show that TDS levels in Snap Lake are subject to the treated effluent discharge from the Mine. The Lower Bound is the most likely scenario, and TDS levels in Snap Lake were predicted to be lower than the new Water Quality Objective (1000 mg/L) under both De Beers' Lower Bound and SLEMA's Conservative Scenario.

Land Use Permit

De Beers holds two Land Use Permits (LUPs), i.e. MV2010D0053 and MV2014D0010.

MV2010D0053 was approved by the MVLWB on February 16, 2011, for a period of 5 years commencing February 16, 2011 and expiring February 15, 2016. This Permit entitles De Beers to conduct the related activities associated with diamond mining and milling production as outlined in the Land Use Application dated October 29, 2010 and the Consolidated Project Description, submitted by De Beers on November 24, 2003.

MV2014D0010 was approved by the MVLWB on June 19, 2014, for period commending June 19, 2014 and expiring February 15, 2016. This Permit entitles De Beers to conduct the two land-use operations at the Mine, i.e. the storage of fuel and construction of fuel storage facilities.

Extension of the Land Use Permits

De Beers submitted a request for two-year extension of Land Use Permits MV2010D0053 and MV2014D0010 on December 1, 2015.

In requesting this extension to the expiry date, De Beers did not request any other changes to the conditions of the permits. The extension of the permits will allow for the continuation mining and associated activities at the Snap Lake Diamond Mine.

De Beers planned to apply for an expansion of the North Pile, and that would be the appropriate process during which to review any necessary changes to land use conditions.

De Beers had notified the following Aboriginal Parties on the LUP extension through letters submitted on November 17, 2015, and claimed that no concerns were noted from them.

- Łutsel K'e Dene First Nation,
- North Slave Métis Alliance,
- Tłı̨chǫ Government, and
- Yellowknives First Nation.

SLEMA reviewed the Request and did not raise any concerns. SLEMA believed that the suspension of mine operations announced on December 4, 2015 would not affect the LUP extension, because under the scenario of Care and Maintenance of the Mine, De Beers also needs the LUPs to be extended to conduct related activities.

The MVLWB granted De Beers the two-year extension for the two LUPs on January 21, 2016.

Fisheries Authorization

DFO provided a single Authorization with multiple components/ conditions for the Snap Lake project. All components fall under the Fisheries Act Authorization SC-00-196-2012A. The Authorization is for "Zone of Turbulence at the site of the treated effluent discharge", and that remains valid until 2020. All of the conditions within it have been fulfilled.

Suspension of Operations at Snap Lake Mine

De Beers announced on December 4, 2015 that Snap Lake Mine was being placed under care and maintenance effective Friday, December 4, 2015.

De Beers made the decision based on a thorough review. The main reason was that global diamond markets were experiencing an extended downturn with falling demand and reduced prices.

It is stated in the notification to SLEMA that De Beers intended to maintain a small workforce on the mine site who would be responsible for ensuring Snap Lake Mine continues to meet conditions of the Mine's Water Licence and other requirements.

Care and Maintenance

Care and Maintenance is the status of a mine when it undergoes a temporary closure.

The *Guidelines for the Development of Closure and Reclamation Plans for Advanced Mineral Exploration and Mine Sites in the Northwest Territories,* published by the Mackenzie Valley Land and Water Boards and AANDC in November 2013, describes the requirements of a temporary closure.

As defined in the Guidelines, Temporary Closure occurs when an advanced mineral exploration or mining operation ceases with the intent of resuming activities in the near future. Temporary closure could be due to an unplanned closure or a planned closure of certain facilities in a complex mining project.

The Guidelines require that, during temporary closure, proponents must maintain all operating facilities and programs necessary to protect humans, wildlife, and the environment, including necessary environmental monitoring.

There were two events of Care and Maintenance at the Mine site in the past.

- During the Advanced Exploration Project (AEP) for Snap Lake Mine, in late 2001, the mine went into care and maintenance mode. Pumping equipment was removed and the mine was allowed to flood. The mine remained in care and maintenance until completion of permitting in mid-2004.
- In 2009, the site went into care and maintenance mode due to the global economic downturn. Operational activities resumed in the same year and in 2010 a production ramp up at Snap Lake occurred, with associated staffing level increases.

De Beers submitted the Interim Closure and Reclamation Plan (ICRP) in July 2013. There are very specific descriptions about what and how De Beers will do during the temporary closure period.

SLEMA preliminarily reviewed De Beers' notification of suspension of operations at Snap Lake Mine and related sections in the ICRP, and did not expected extra environmental impacts associated with the shut-down if De Beers followed the ICRP.

SLEMA may have to prepare for the review of the Final Closure Plan in 2016 if De Beers decide to shut down the Snap Lake Mine permanently.

Care and Maintenance Plan

De Beers submitted the Care and Maintenance Plan on January 8, 2016. The Plan is intended to replace the approved Section 7.0, Interim Closure and Reclamation Plan (ICRP).

The Plan describes the activities to be undertaken during the suspension phase, as well as the ongoing activities that will maintain compliance with related regulatory requirements.

As part of the optimization of the on-going care and maintenance activities, De Beers promised in the Plan to actively seek to reduce the impacts to the environment, and intended to conduct additional technical and economic evaluations exploring a partially and fully flooded underground mine.

The Plan is Version 1, and subject to modifications in the near future. SLEMA reviewed the Plan and did not raise any concerns on the Plan.

SLEMA Modeling Update – Care and Maintenance

SLEMA updated the water quality model for Total Dissolved Solids (TDS) in March 2016 after De Beers announced the operation suspension on December 5, 2015.

TDS modeling back test, with data up to February 2016, indicated that the correlation coefficient of the two data sets (observed values and modeling results) is 0.998, and confirmed the model capable of predicting future whole lake average of TDS concentrations in Snap Lake (SNP 02-18).

Three scenarios were applied to assess the impacts of mining suspension on water quality in Snap Lake.

- Dewatering Scenario: Dewatering during Care and Maintenance period (up to 2028),
- Flooding Scenario 1: Flooding the underground workings during Extended Care and Maintenance period (up to 2028), and
- Flooding Scenario 2: Flooding the underground workings during Extended Care and Maintenance period (up to 2019).

Modeling results show that

- If dewatering continues, TDS levels in Snap Lake will go up but will be lower than the TDS levels of treated effluent (assume 650 mg/L), all the time.
- Under Flooding Scenario 1, TDS levels in Snap Lake will be lower than 350 mg/L (previous Water Licence) in 2028.
- Under all three scenarios, the TDS levels in Snap Lake will be lower than the Water Quality Objective (1000 mg/L). The impacts on water quality are expected to be lower than that during normal production.

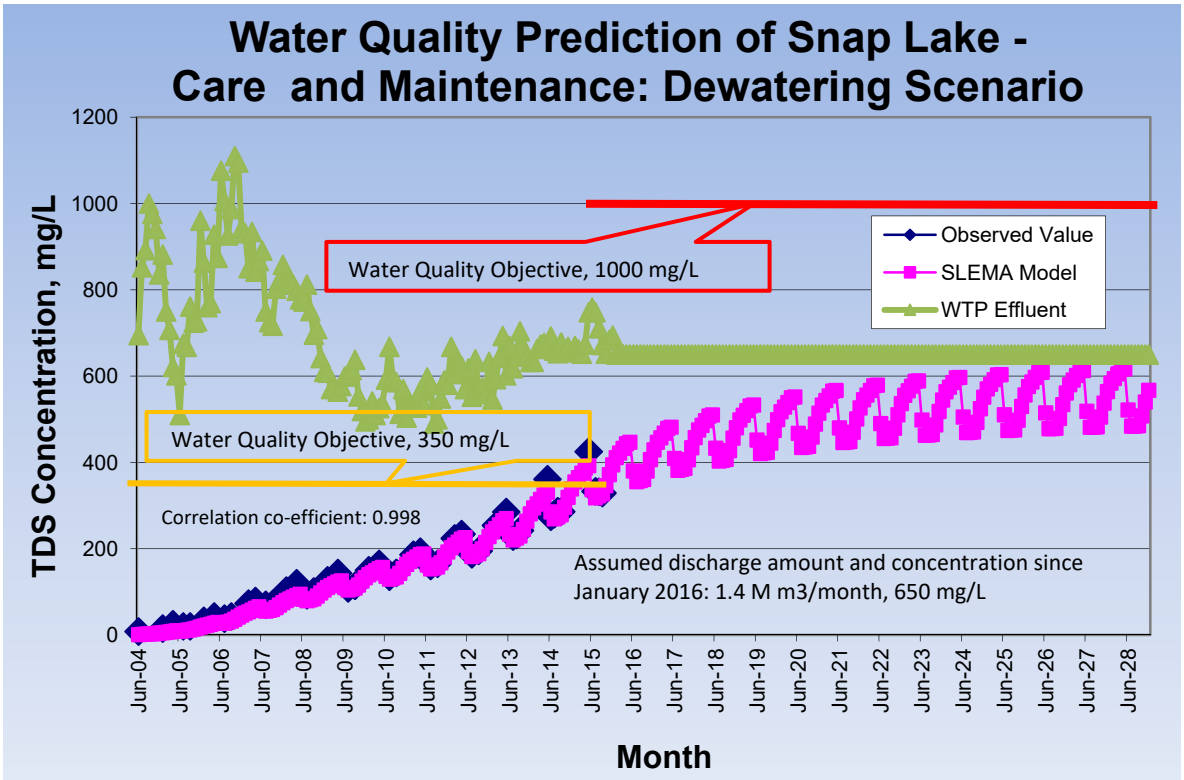


Figure 7. Prediction under Dewater Scenario

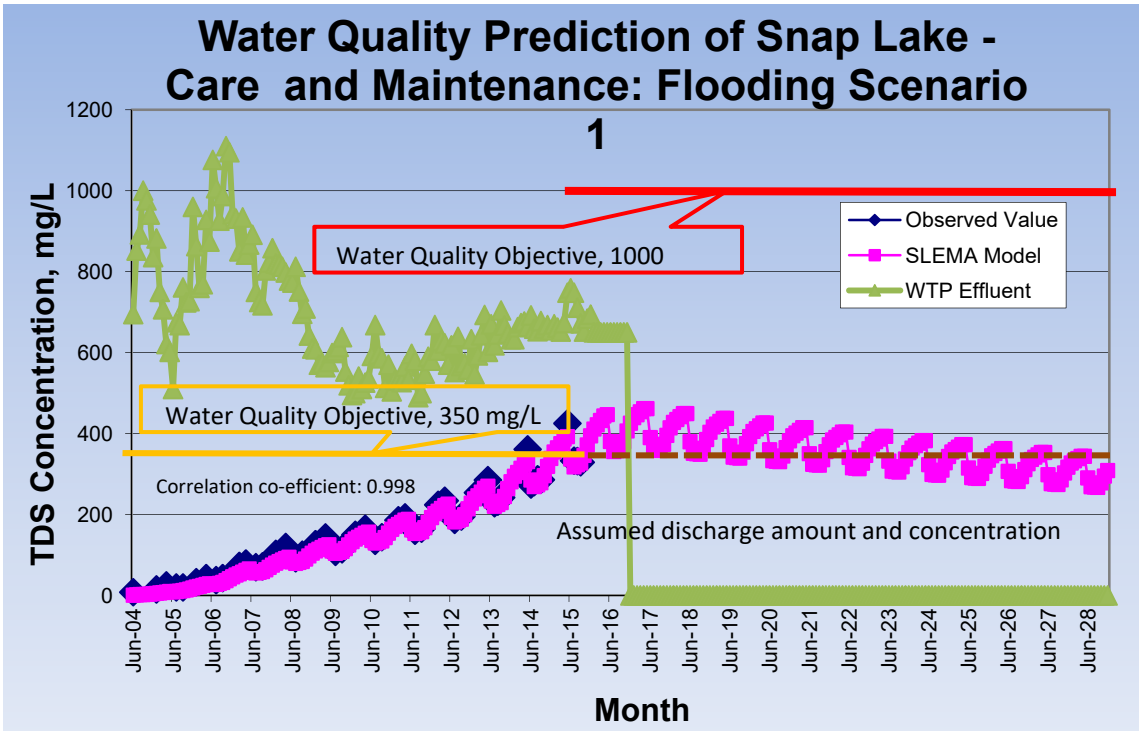


Figure 8. Prediction under Flooding Scenario 1

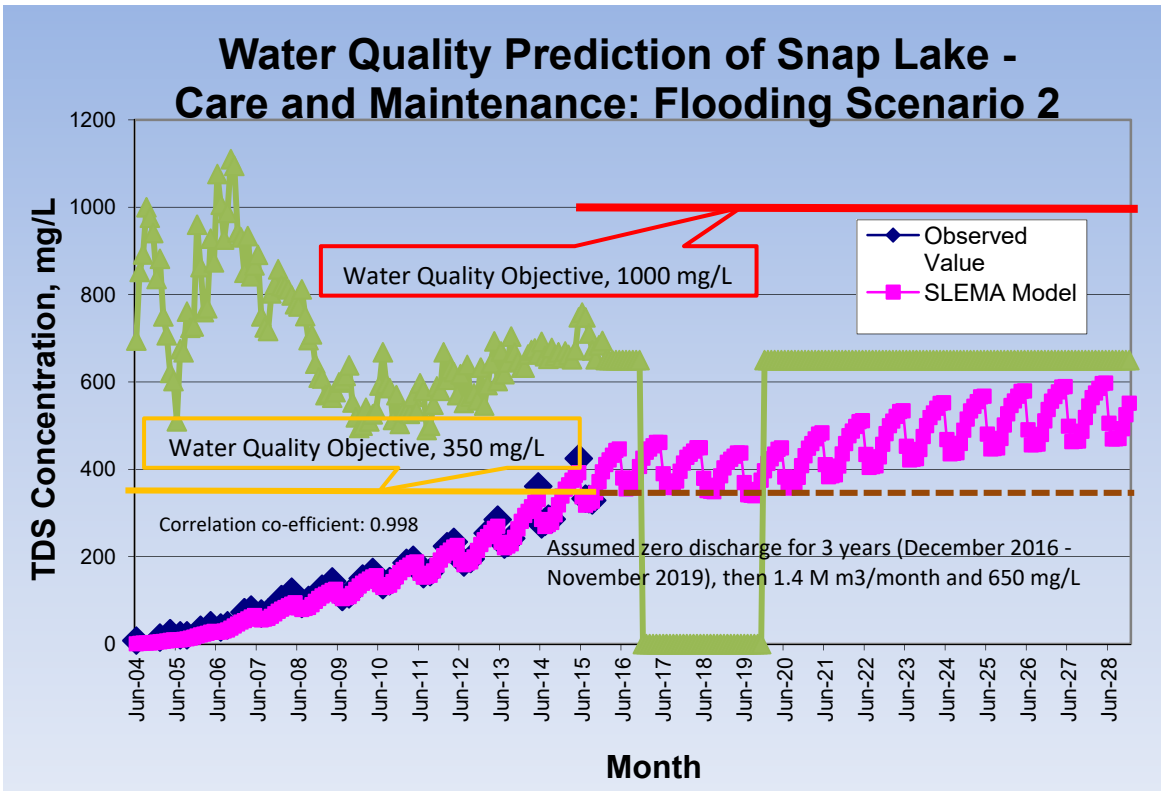


Figure 9. Prediction under Flooding Scenario 2

Assessment of the Mine

De Beers generally ran the Snap Lake Diamond Mine in a way that upheld the vast majority of its environmental commitments during the reporting period of 2015-2016.

De Beers has obtained what it asked for in the Water Licence Amendment Application Processes (December 2013 and November 2014), and may not be going to have any compliance problems associated with TDS in the future.

With regards to the mining suspension announced in December 2015, SLEMA encourages De Beers to take diligent efforts in managing the mine site during the period of the Care and Maintenance.

Assessment of Regulators

SLEMA not only monitors the environmental performance of De Beers Snap Lake Diamond Mine, but also the government agencies that regulate 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.

Mackenzie Valley Land and Water Board (MVLWB):

The MVLWB ran well managed processes for the review of updated management plans, annual reports, and De Beers' requests and applications during the period of April 2015 to March 2016.

The MVLWB worked closely with De Beers and interested parties on the Water Licence Amendment Applications, and completed the regulatory processes in 2015. The MVLWB issued the amended Water Licence for the November 2014 Amendment Application on May 5, 2015 and the amended Water Licence for the December 2013 Amendment Application on September 16, 2015**.**

SLEMA appreciated the MVLWB holding the Snap Lake Mine Working Group Meetings, which allowed for open discussion and clarification of current topics related to Snap Lake Mine.

Environment Canada (EC): EC contributed to the review of related requests, study reports, annual reports and plans within its jurisdiction. EC also played an important role in the Water Licence Amendment Applications.

Department of Fisheries and Oceans (DFO): DFO contributed to the review of related requests, study reports, annual reports and plans within its jurisdiction.

Department of Lands: The Inspector, Jamie Steele, conducted twelve Water Licence inspections and one Land Use Permit Inspections during the period of April 2015 to March 2016. He also made comments on related management plans, De Beers' requests and applications.

SLEMA is satisfied with his performance, and concludes that the inspectors showed diligence and initiative during inspection and investigation.

Department of Environment and Natural Resources (GNWT-ENR): ENR has been involved in the review of Environmental Agreement Annual Reports, wildlife issues, waste management issues, air quality issues, Water Licence and Land Use Permit related issues. ENR also played a very important role in the Water Licence Amendment Applications.

Overall SLEMA is pleased with the regulators' actions and responses in regards to their respective responsibilities for the Snap Lake Mine.

Table 3. Contributions to Documents Review, April 2015 to March 2016

Document Reviewed	Valuable Comments from	
	Regulators/Stakeholders	Aboriginal Parties
Engagement Plan	ENR	
Cesium and Thallium Response Plan	EC, ENR	
Care and Maintenance Plan	EC, ENR, DFO	
Downstream Water Courses Special Study Plan Year 2	True North Safaris Ltd., EC, ENR, DFO	
AEMP Design Plan Deferral Request	EC, ENR	
Management Plan Deferral Request	EC, ENR	Tlicho
Land Use Permit Extension Request	EC	NSMA
Waste Management Plan – Hazardous Waste Containment Facility	EC, ENR	
TDS Correlation with Inline Parameters	EC, ENR	
Request to Change ELS Requirements of SNP	EC, ENR	
AEMP 2014 Annual Report	EC, ENR	
North Pile Management Plan Response Threshold - Nitrate Exceedance Memo	True North Safaris Ltd., ENR	
Downstream Water Courses Special Study Plan	EC, ENR, DFO	
2014 Annual Closure and Reclamation Plan Progress Report	ENR	
AEMP – C. dubia low action level Response Plan	EC, ENR	
Water Licence 2014 Annual Report	EC, ENR	
AEMP low action level triggered for aesthetic drinking water - Chloride	ENR	
Emergency Response Plan	ENR	
AEMP Low Action Level Triggered for Aesthetic Drinking Water	ENR	YKDFN

Summary of SLEMA Comments from April 2015 to March 2016

The comments and recommendations for those documents reviewed by SLEMA from April 2015 to March 2016 are summarized as follow.

Table 4. Summary Table of SLEMA Comments from April 2015 to March 2016

Date	Addressee	Concern	Subject	Comment	Recommendation	Feedback/Response
03/24/ 2016	ENR		2014 EAAR	De Beers submitted the draft EAAR 2014 on January 11, 2016. SLEMA reviewed the draft EAAR 2014 and provided comments via e-mail on February 16, 2016. De Beers made related revisions and submitted the official report with aboriginal language summary on March 4, 2016. SLEMA requested improvements in the description of compliance issues, responses to public concerns and report presentation. In response to SLEMA's comments, De Beers made related revisions in the official submission. SLEMA believes the EAAR 2014 is satisfactory.		
01/05/ 2016	MVLWB		LUP Extension	SLEMA does not have any concerns on De Beers' request for two-year extension of LUPs MV2010D0053 and MV2014D0010.		MVLWB approved the LUP extension request on January 21, 2016.

Table 4. Summary Table of SLEMA Comments from April 2015 to March 2016 (continued)

Date	Addressee	Concern	Subject	Comment	Recommendation	Feedback/Response
12/14/ 2015	MVLWB		Waste Management	No major concerns are raised for the design of the Hazardous Waste Containment Facilities. However, SLEMA has a concern on the on-site disposal of hydrocarbon contaminated rocks within the North Pile.	SLEMA does not believe that it is a good idea to place hydrocarbon contaminated over-sized rocks into the North Pile. It is recommended that De Beers construct a bigger HWCF to contain all hydrocarbon contaminated materials.	MVLWB approved the Waste Management Plan on January 21, 2016.
11/18/ 2015	ENR		Incinerator	SLEMA was looking forward to seeing some concrete action on GNWT's air quality initiative. SLEMA was also pleased by the steps taken by De Beers to address possible operational and management issues with the two incinerators.	SLEMA requested to be copied on all temperature and other data submitted by De Beers.	
10/09/ 2015	MVLWB		TDS	SLEMA agrees that it is not appropriate to base operational decisions on the in-line chloride analyzer, nor to monitor operational compliance on this basis, and in-line electrical conductivity is a better indicator for operational control. As a result, SLEMA supports De Beers' request to change 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".		The MVLWB approved De Beers' request to change SNP reporting from In-house Chloride to in-line Conductivity on November 19, 2015. In addition, the Board required De Beers provide the daily conductivity readings and the correlation equation as it relates to TDS at SNP02-17b, to facilitate interpretation of conductivity reading.

Table 4. Summary Table of SLEMA Comments from April 2015 to March 2016 (continued)

Date	Addressee	Concern	Subject	Comment	Recommendation	Feedback/Response
09/24/2015	NWT Cumulative Impact Monitoring Program		Investigating Changes to Plankton Communities	NWT Cumulative Impact Monitoring Program proposed a project to investigate changes to plankton communities in waterbodies receiving diamond mine effluent in the NWT to determine whether there are correlations between various effluent constituents and changes in the plankton communities. SLEMA believes this project will provide very useful information that will complement the existing body of knowledge, and fully supports this initiative.		
07/09/2015	MVLWB		Nitrate Thresholds	The threshold for the emergency situation (threshold criterion) at SNP02-17B may not be appropriate, because greater than 100% of the Maximum Average EQC limit (22 mg/L) means noncompliance, which should be prevented from. The two proposed trigger level values for SNP 02-02 are appropriate, because for the past few years, there are only four grab sample with nitrate levels above the proposed Yellow threshold criterion (200 mg/L), and two years (2010 and 2012) with Annual Average nitrate levels above Orange threshold criterion (120 mg/L).	It is recommended that the Red threshold be set at greater than 90% of the Maximum Average EQC limit (22 mg/L).	

Table 4. Summary Table of SLEMA Comments from November April 2015 to March 2016 (continued)

Date	Addressee	Concern	Subject	Comment	Recommendation	Feedback/Response
07/02/2015	MVLWB		2014 AEMP Annual Report	SLEMA does not have any concerns.		
06/30/2015	MVLWB		Downstream Special Study	De Beers proposed 4 new "on the flow path" monitoring stations and 3 new "the flow path" monitoring stations, with current AEMP monitoring stations and 3 GNWT monitoring stations overlapped. It is a reasonable design. It is stated that water quality data from GNWT monitoring stations in King and MacKay lakes would also be used in the Plan (Section 2.2, page 8). However, there are no further discussion on streamlining the monitoring schedule and parameters. Related information is requested.		
06/29/2015	De Beers	Dioxin and Furan	Stack Testing	SLEMA is extremely concerned about De Beers' failure to meet dioxin and furan CWS and, as importantly, about the lack of regulation of air emission in the territory. Therefore we are respectfully requesting a formal update on the situation. By copy of this letter to the Government of the Northwest Territories, we are also requesting this issue in particular, and the issue of air emissions in general, be brought to the attention of the Snap Lake Liaison Committee for discussion and follow up.		De Beers responded on October 6 that De Beers agreed to improve came waste incineration. ENR responded on October 14 that ENR would develop a legislative framework for air quality management in the NWT, and requested De Beers to demonstrate that the operational issues being addressed.

Table 4. Summary Table of SLEMA Comments from November April 2015 to March 2016 (continued)

Date	Addressee	Concern	Subject	Comment	Recommendation	Feedback/Response
06/19/ 2015	MVLWB		2014 Closure Annual Report	SLEMA does not have any concerns.		
05/19/ 2015	MVLWB		Water Licence Annual Report	SLEMA identified a few data errors which need to be corrected. No concerns are raised for the appendices.	It is recommended Section 17 report the SNP 02-18 data and the monthly average data for SNP 02-17B in future annual reports.	
05/04/ 2015	Inspector	Compliance	TDS	SLEMA analyzed the TDS data at SNP 02-20 from the February and March 2015 SNP Monthly Reports and is of the opinion that TDS level at SNP 02-18 may have exceeded the current water licence limit of 350 mg/L since January 2015.	SLEMA recommends that the Inspector initiate an investigation to confirm De Beers' compliance to its water licence.	The Inspector responded on May 11 that he could not initiate an investigation based on model predictions, and he did not expected an exceedance due to the amended water licence.
04/13/ 2015	MVLWB		Draft WL	Suggestion 2 of EA1314-02 is not reflected in conditions set out in the Water Licence. TDS is not defined in the Water Licence.	The MVLWB add related conditions into Part I. Conditions Applying to Closure and Reclamation. The MVLWB clearly define TDS in Part A. Scope and Definitions, and require De Beers to report both TDS calculated and TDS measured for SNP 02-15, SNP 02-17B, SNP 02-18 and SNP 02-20.	De Beers responded on April 17, 2015. De Beers strongly disagreed with SLEMA's recommendation on Suggestion 2. De Beers agreed with SLEMA that TDS should be defined in Part A.

Acronyms

AANDC – Aboriginal Affairs and Northern Development Canada
AN – Ammonia Nitrate
ARD – Acid Rock Drainage
AEMP – Aquatic Effects Monitoring Program
CCME – Canadian Council of Ministers of the Environment
DFO – Department of Fisheries and Oceans
DKFN – Deninu Kue First Nation
EAR – Environmental Assessment Report
EC – Environment Canada
EQC – Effluent Quality Criterion
EMS – Environmental Management System
ENR – Environment and Natural Resources (GNWT)
GNWT – Government of the Northwest Territories
INAC – India and Northern Affairs Canada (before May 2011) or Indigenous and Northern Affairs Canada (after November 2015)
LKDFN – Lutsel K'e Dene First Nations
MVEIRB – Mackenzie Valley Environmental Impact Review Board
MVLWB – Mackenzie Valley Land and Water Board
MVRMA – Mackenzie Valley Resource Management Act
NSMA – North Slave Metis Alliance
NWTMN – Northwest Territory Metis Nation
PK – Processed Kimberlite
SLEMA – Snap Lake Environmental Monitoring Agency
SNP – Surveillance Network Program

- SNP 02-17B – Final Combined Water Treatment Plant and Sewage Treatment Plant effluent that is discharged via a diffuser into Snap Lake. Under normal conditions 02-17B is used which measures the permanent water treatment plant. In conditions where greater capacity is needed, 02-17 can be used as it represents the effluent from the temporary water treatment plant.
- SNP 02-18 – 10 monitoring stations in the main basin of Snap Lake that are used to calculate a whole lake average concentration of Total Dissolved Solids.
- SNP 02-20 – Snap Lake on the edge of the mixing zone around the diffuser (4 stations, called SNP 02-20d, e, f and g, located in a radius of 120 degrees at 200 meters from the diffuser).

TDS – Total Dissolved Solids
TK – Traditional Knowledge
WMP – Water Management Pond
WQO – Water Quality Objective
WTP – Water Treatment Plant
YKDFN – Yellowknives Dene First Nations

Financial Statements

Snap Lake Environmental Monitoring Agency

Financial Statements

March 31, 2016

Snap Lake Environmental Monitoring Agency

Financial Statements

March 31, 2016

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Independent Auditors' Report

To the Directors of Snap Lake Environmental Monitoring Agency

We have audited the accompanying financial statements of Snap Lake Environmental Monitoring Agency, which comprise the statement of financial position as at March 31, 2016, and the statements of operations, changes in net assets and cash flows for the year then ended, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Financial Statements
Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian accounting standards for not-for-profit organizations, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility
Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditors consider internal control relevant to the Agency's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Agency's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Crowe MacKay

Independent Auditors' Report (continued)

Opinion
In our opinion, the financial statements present fairly, in all material respects, the financial position of Snap Lake Environmental Monitoring Agency as at March 31, 2016, and the results of its operations and its cash flows for the year then ended in accordance with Canadian accounting standards for not-for-profit organizations.

Crowe Mackay LLP

Yellowknife, Canada
August 31, 2016

Chartered Accountants

Snap Lake Environmental Monitoring Agency

Statement of Operations

For the year ended March 31	2016	2015
Revenues		
De Beers Canada Mining Inc.	$ -	$ 1,048,551
Transferred from (to) deferred revenue	**477,116**	(530,420)
	477,116	518,131
Expenditures		
Accounting and legal	**12,170**	12,249
Amortization	**1,233**	457
Bookkeeping	**10,800**	10,800
Honoraria	**129,070**	136,097
Insurance	**2,648**	1,892
Interest and bank charges	**1,065**	844
Meetings - catering, translation, and rentals	**8,925**	15,399
Meetings - travel and accommodation	**26,951**	34,299
Office and administration	**11,086**	13,636
Rent	**36,540**	36,540
Wages and benefits	**227,374**	250,475
	467,862	512,688
Excess of revenues before other items	**9,254**	5,443
Other items		
Transfer to investment in tangible capital assets	**(1,233)**	(457)
Purchase of capital assets	**2,664**	2,416
	1,431	1,959
Excess of revenues	**$ 7,823**	$ 3,484

Snap Lake Environmental Monitoring Agency

Statement of Changes in Net Assets

For the year ended March 31, 2016

	Unrestricted net assets (liabilities)	Investment in tangible capital assets	**Total 2016**	Total 2015
Balance, beginning of year	$ (7,823)	$ 3,677	**$ (4,146)**	$ (9,589)
Excess of revenues over expenditures	7,823	-	**7,823**	3,484
Amortization	-	(1,233)	**(1,233)**	(457)
Additions	-	2,664	**2,664**	2,416
Balance, end of year	**$ -**	**$ 5,108**	**$ 5,108**	$ (4,146)

Snap Lake Environmental Monitoring Agency

Statement of Financial Position

As at March 31,	2016	2015
Assets		
Current		
Cash	**$ 94,107**	$ 561,443
Prepaid expenses and deposits	**3,958**	7,026
	98,065	568,469
Tangible capital assets (note 3)	**5,108**	3,677
	$ 103,173	$ 572,146
Liabilities		
Current		
Accounts payable and accrued liabilities (note 4)	**$ 44,761**	$ 45,872
Deferred revenue	**53,304**	530,420
	98,065	576,292
Fund balances		
Unrestricted net assets (liabilities)	**-**	(7,823)
Investment in tangible capital assets	**5,108**	3,677
	5,108	(4,146)
	$ 103,173	$ 572,146

Approved on behalf of the board:

_____ Director _____ Director

Snap Lake Environmental Monitoring Agency

Statement of Cash Flows

For the year ended March 31,	2016	2015
Cash provided by (used for)		
Operating activities		
Excess of revenues	**$ 9,254**	$ 5,443
Item not affecting cash		
Amortization	**1,233**	457
	10,487	5,900
Change in non-cash working capital items		
Prepaid expenses and deposits	**3,068**	(284)
Accounts payable and accrued liabilities	**(1,111)**	20,697
Deferred revenue	**(477,116)**	530,420
	(464,672)	556,733
Investing activity		
Purchase of tangible capital assets	**(2,664)**	(2,416)
Increase (decrease) in cash	**(467,336)**	554,317
Cash, beginning of year	**561,443**	7,126
Cash, end of year	**$ 94,107**	$ 561,443

1. Nature of operations

Snap Lake Environmental Monitoring Agency ("the Agency") is a not-for-profit organization incorporated under the *Societies Act* of the Northwest Territories. It is exempt from income tax under Section 149(1)(l) of the *Income Tax Act*.

The mission of the Agency is to oversee environmental management of the De Beers Snap Lake Diamond Project.

The Agency was incorporated and commenced operations on December 10, 2004.

2. Significant accounting policies

These financial statements are prepared in accordance with Canadian accounting standards for not-for-profit organizations. The significant policies are detailed as follows:

(a) Financial instruments- recognition and measurement

(i) Measurement of financial instruments

The Agency initially measures its financial liabilities at fair value adjusted by, in the case of a financial instrument that will not be measured subsequently at fair value, the amount of transaction costs directly attributable to the instrument.

The Agency subsequently measures its financial assets and liabilities at cost or amortized cost.

Financial assets measured at amortized cost includes cash.

Financial liabilities measured at amortized cost include accounts payable and accrued liabilities.

No financial assets or financial liabilities have been subsequently measured at fair value.

2. Significant accounting policies (continued)

(ii) Impairment

Financial assets measured at amortized cost are tested for impairment when there are indicators of possible impairment. When a significant adverse change has occurred during the period in the expected timing or amount of future cash flows from the financial asset or group of assets, a write-down is recognized in net income. The write down reflects the difference between the carrying amount and the higher of:

- the present value of the cash flows expected to be generated by the asset or group of assets;

- the amount that could be realized by selling the assets or group of assets;

- the net realizable value of any collateral held to secure repayment of the assets or group of assets.

When the events occurring after the impairment confirm that a reversal is necessary, the reversal is recognized in net income to a maximum of the accumulated impairment loss recorded in respect of the particular financial asset.

(b) Tangible capital assets

Tangible capital assets are recorded at original cost plus any costs of betterment less accumulated amortization and excludes any assets not in current use. Amortization is calculated when the tangible capital assets are ready in use by the declining balance method at the annual rates set out in note 3.

(c) Fund accounting

Unrestricted net assets reflect the revenue and expenses from operations. Investment in tangible capital assets fund represents the accumulated cost of acquired tangible capital assets net of disposals and amortization.

(d) Revenue recognition

The Agency follows the deferral method of accounting. The Agency recognizes unrestricted contributions when they are received or receivable if the amount receivable can be reasonably estimated and its collection is reasonably assured. Restricted contributions are recognized as revenue when the terms and conditions are met. The portion of revenue related to projects not completed at year end is deferred. This will be brought into income as the goods and services are acquired. Contributions for projects for which unexpended funds must be reimbursed at the end of the fiscal year are shown as contributions repayable.

2. Significant accounting policies (continued)

(e) Use of estimates

The preparation of financial statements in conformity with Canadian accounting standards for not-for-profit organizations requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the balance sheet date and the reported amounts of revenues and expenses during the year. Actual results could differ from those estimates.

3. Tangible capital assets

				2016	2015
	Rate	Cost	Accumulated amortization	Net book value	Net book value
Furniture and fixtures	20%	$ 12,322	$ 9,009	$ 3,313	$ 3,677
Computer equipment	45-55%	6,930	5,135	1,795	-
Computer software	100%	5,556	5,556	-	-
		$ 24,808	$ 19,700	$ 5,108	$ 3,677

4. Accounts payable and accrued liabilities

	2016	2015
Accounts payable and accrued liabilities	$ 36,353	$ 44,364
Government remittances payable	8,408	1,508
	$ 44,761	$ 45,872

5. Economic dependence

The Agency receives all of its contribution funding from De Beers Canada Mining Inc. Management is of the opinion that operations would be significantly affected if the funding was substantially curtailed or ceased. In December 2015, DeBeers announced that the mine ceased operations and entered care and maintenance.

6. Commitments

The Agency has entered into a premise lease agreement commencing May 1, 2016 and expiring May 31, 2017 for $1,100 per month plus GST.

7. Comparative figures

The financial statements have been reclassified, where applicable, to conform to the presentation used in the current year.

8. Financial instruments

The following section describes the Agency's financial risk management objectives and policies and the Agency's financial risk exposures:

(a) Credit risk

Credit risk is the risk that one party to a transaction will fail to discharge an obligation and cause the other party to incur a financial loss. The Agency does have credit risk in cash of $94,107 (2015 - $561,443) as a result of having average fund balances with a chartered bank in excess of the insurable limit throughout the year. Furthermore, the Agency has a concentration risk as full balance of cash is held at one financial institution. This risk has decreased from the prior year due to the decreased cash balance.

(b) Liquidity risk

The Agency does have a liquidity risk in the accounts payable and accrued liabilities of $44,761 (2015 - $45,872). Liquidity risk is the risk that the Agency cannot repay its obligations when they become due to its creditors. This risk has not changed from the prior year.

There is a concentration of liquidity risk as there is 44% (2015 - 66%) of accounts payable and accrued liabilities are due to employees.