January 2018 Environmental Update for SLEMA Board

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January 31, 2018

Outline

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

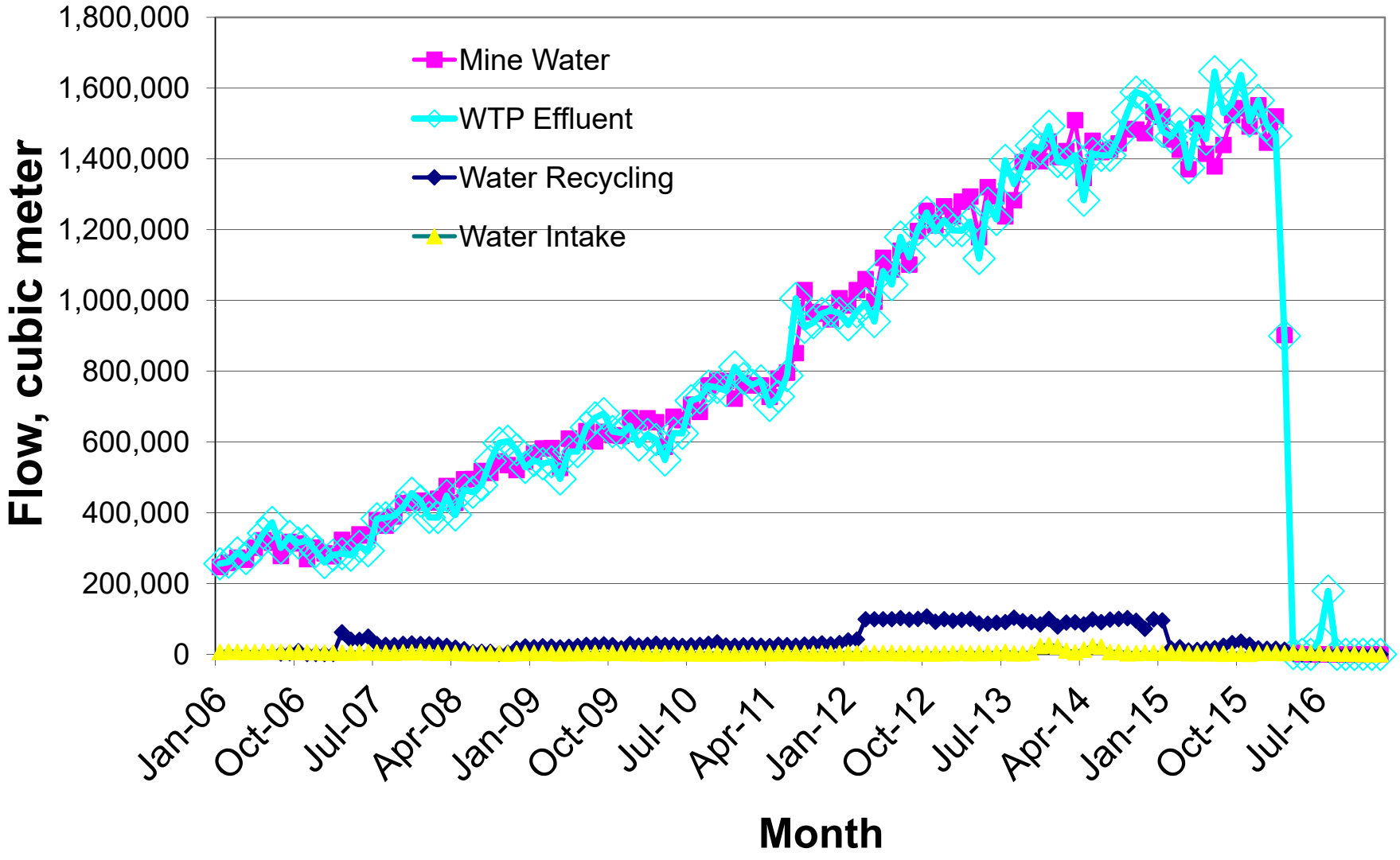
Acronyms

- AEMP – Aquatic Effects Monitoring Program
- ARD – Acid Rock Drainage
- DFO – Fisheries and Oceans Canada
- ECCC – Environment and Climate Change Canada
- ECM – Extended Care and Maintenance
- ENR – Department of Environment and Natural Resources, GNWT
- EQC – Effluent Quality Criterion
- GNWT – Government of the Northwest Territories
- INAC – Indigenous and Northern Affairs Canada (formerly Aboriginal Affairs and Northern Development Canada [AANDC])
- MVEIRB – Mackenzie Valley Environmental Impact Review Board
- MVLWB – Mackenzie Valley Land and Water Board
- PK – Processed Kimberlite
- SLEMA – Snap Lake Environmental Monitoring Agency
- SNP – Surveillance Network Program
- SSWQO – Site-Specific Water Quality Objective
- TDS – Total Dissolved Solids
- WEMP – Wildlife Effects Monitoring Program
- WTP – Water Treatment Plant
- WMP – Water Management Pond

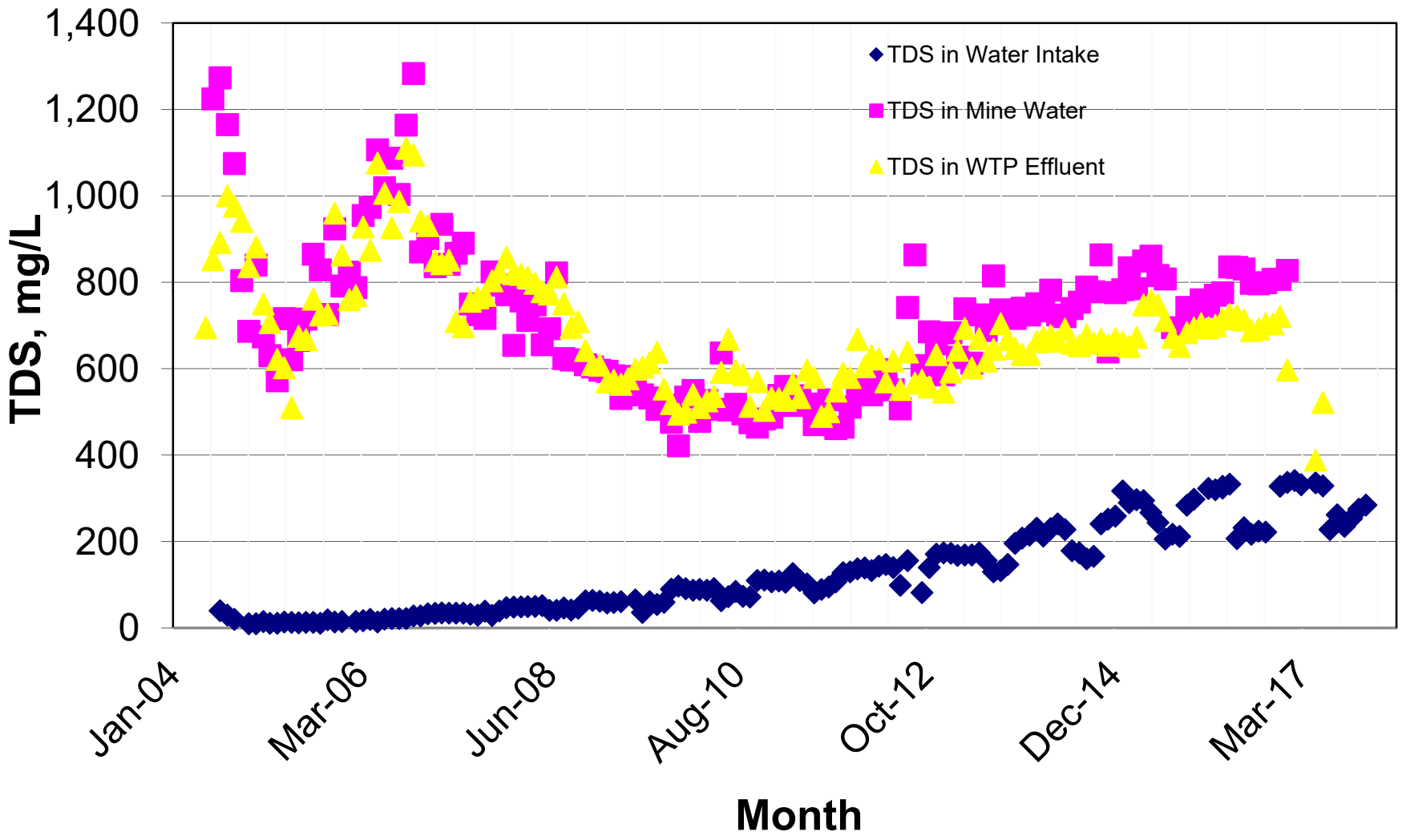
1.1 Mine Update – December 2017

- The Snap Lake Mine remained in suspended operations (Extended Care and Maintenance)
  - 170 m^3 of water withdrawn from Snap Lake
  - No treated water discharged into Snap Lake
- One reportable spill
- Water sampled in 2 monitoring stations
  - SNP 02-15 (water intake) and SNP 02-16j (sewage effluent)
    - No concerns are raised

Water Flows at the Mine



Yearly TDS Analysis



2. Inspection Update

- Inspector – Tracy Covey
- Water Licence Inspections
  - Inspected on December 6, 2017, and reported on January 12, 2018
  - Inspected on January 10, 2018, and reported on January 17, 2018

2.1 Water Licence Inspection on December 6, 2017

- Reported on January 12, 2018
  - North Pile, Sumps and ditches, Waste Transfer Area, Dam 1, Fuel Transfer Module and 10 Million Liter Tank Farm inspected
  - No environmental risks noted
  - Some unusual pH readings at SNP 02-11 (downgradient from the Water Management Pond) from data submitted in the October 2017 SNP report
    - An analysis/explanation of these reading requested

The landfill (left) and burn pit is seeing light use with the current low camp population

Snow-free Dam 1 of the Water Management Pond

Long beach showing recent/fresh input of flood ice (seepage) in Sump 4. Small loss of capacity was noted

The road to the Fuel Transfer Station showed effective snow removal

The Nozzle stored inside an enclosed drip tray in the Fuel Transfer Station

2.2 Water Licence Inspection on January 10, 2018

- Reported on January 17, 2018
  - North Pile, Sumps and ditches, Waste Transfer Area, Dam 1, Fuel Transfer Module, 10 Million Liter Tank Farm, and Site of Spill 17-440 inspected
  - No environmental risks noted
    - Some invalid SNP sample results were reported for station 02-02
      - An analysis/explanation of these reading requested
    - Protocols and practices associated with snc removal and inspection of fuel storage tanks would appear to need re-evaluation

No visible open water was observed inside the Starter Cell, Cell D

Seepage into Sump 4 (East End, left photo)
An excavator had recently removed ice from a significant portion of the sump (about ½), basically from areas where ice could be safely removed (West End, right photo)

Significant inflow of ice-flow was not observed in Sump 3, or any of the other sumps (except Sump 4)

Drums of contaminated snow and gravel were removed from the 17-440 spill site

3. Regulators' Update – MVLWB (I)

- Approved De Beers' request to reduce the frequency of external sampling to every two weeks at SNP 02-16j for Biological Oxygen Demand (BOD), nutrients, Total Oil and Grease, TSS, E. *Coli* and Faecal Coliforms, on January 11, 2018
- MVLWB staff commented De Beers' Notification of Final Closure and Request to not file an ICRP, on January 15

3.1 Staff Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (I)

- Many SNP stations require daily monitoring during heavy rainfall events if measurable flow is present. What will be the response time for a crew to mobilize to site should these events occur? What if there is inclement weather and it is unsafe to fly to site to meet monitoring requirements? Further, if a month passes without regular airstrip maintenance during heavy snowfall, how will this effect aircraft landing? Are there back-up measures in place to ensure these proposed monthly commitments are met?

3.1 Staff Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (II)

- When the team is on site for monthly visits, how many days will they be on site during zero occupancy periods to complete all necessary maintenance as described in this Plan? How many crew members, at a minimum, will be on site for visits during periods of zero occupancy, as well as periods of occupancy?

3.1 Staff Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (III)

- Section 1 of the Spill Contingency Plan discusses the re-opening of Snap Lake Mine as an option being investigated, however this is not consistent with the information presented in the ECMP v.2. Additionally, Section 6.4 states: "Weekly inspections of the upstream face, crest and downstream face of the dams are carried out to identify water levels relative to the crest, erosional features, and displaced or eroded rip rap, sinkholes, or visible seepage, tears in the liner or cracks in the dam structure." As De Beers is proposing monthly site visits, are these weekly inspections to be carried out via visual/video methods?

3.1 Staff Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (IV)

- Board staff recommend this Plan be revised to ensure all sections appropriately describe the current plan for Water Management practices in 2018 and onward

4. Aboriginal Update

- Lutsel Ke Dene First Nation commented the Extended Care and Maintenance Plan V2.0 on January 15, 2018
  - Highlighted the need for a socio-ecological approach to compliment the technically driven process of reclamation
  - Detailed the concerns of the community and desired mitigation strategies

4.1 LKDFN Comments on the Extended Care and Maintenance Plan V2.0 (I)

- LKDFN requests that De Beers reassess the Snap Lake Mine: Extended Care and Maintenance Plan V2.0
  - *"It is our intent that these passages be considered at face-value and we request that they be deemed equally important to that of scientific observations, as ŁKDFN will live with the impacts of mine decommissioning for generations to come."*

4.1 LKDFN Comments on the Extended Care and Maintenance Plan V2.0 (II)

- Uncertainties
  - What lies below the surface, and who becomes responsible for it following the departure of a mining company
  - The surface-subsurface disconnect is a growing area of concern

4.1 LKDFN Comments on the Extended Care and Maintenance Plan V2.0 (III)

- Trust
  - Community-level trust is required for social license to operate, and further is pertinent for a successful community-industry relationship
    - *"we suggest that additional information dissemination is necessary to restore social license to and ensure safety for the community."*
    - *"ŁKDFN requires stronger levels of engagement, manifested through a greater degree of knowledge-sharing practices during this tim[illegible] industrial decoupling."*

4.1 LKDFN Comments on the Extended Care and Maintenance Plan V2.0 (IV)

- Transparency and Accountability
  - The emphasis for reclamation to maintain the highest and most up-to-date standards becomes apparent
  - Ensuring that the liability of a corporation is legally bound in the decades to come provides security and peace of mind for communities

4.1 LKDFN Comments on the Extended Care and Maintenance Plan V2.0 (V)

- Infrastructure Removal
  - The removal of infrastructure is a source of concern for community members due to the lingering uncertainties and ecological threats these structures pose
    - to prevent the residual historical scar on the land base
    - reintroduction of the area to animals in the region
    - ensuring contamination from these buildings is reduced to a minimum

4.1 LKDFN Comments on the Extended Care and Maintenance Plan V2.0 (VI)

- Dust
  - The uncertainty surrounding the chemical composition, geographical extent and potential impacts of the dust are of immediate concern
    - It is essential to develop a protocol to remediate regional impacts from dust and chemical deposits

4.1 LKDFN Comments on the Extended Care and Maintenance Plan V2.0 (VII)

- Roads
  - The development of roads in a previously untouched region is one of the most impactful and long lasting impacts derived from the development of mining operations
    - These roads significantly impact the traditional Dene Way of Life by perpetuating the decline in caribou by increasing accessibility to the region
    - Roads present unnatural barriers to animals and create obstacles in the natural flow of ecosystems

4.1 LKDFN Comments on the Extended Care and Maintenance Plan V2.0 (VIII)

- Caribou Health
  - The increasing pressures on caribou are manifestations of the mounting cumulative effects; implying that caribou are declining in both population and health
- Treatment of Contaminants
  - Mounting community observations highlight the direct impacts from the mines altering food security through contamination

4.1 LKDFN Comments on the Extended Care and Maintenance Plan V2.0 (IX)

- Loss of TK
  - With the encroachment of natural resource developments on the traditional Akaitcho Territory, the land base is becoming increasingly less accessible, resulting in a loss of traditional knowledge

4.1 LKDFN Comments on the Extended Care and Maintenance Plan V2.0 (X)

- Reconstructing Vegetative Health
  - Throughout this process, many individuals raised concerns and ideas regarding the necessity to revegetate the landscape to an equal or similar pre-mine state. These concerns are centralized around the length of time required to return the land to its original or similar state and the desire to fast track the process through assisted vegetative processes such as tree planting, improving soil health and removing contaminants. In addition to revegetation practices, continual testing and monitoring need to occur to maintain a level of safety and ecological stabili the region

4.1 LKDFN Comments on the Extended Care and Maintenance Plan V2.0 (XI)

- Continual Community-Based Monitoring
  - Community-based monitoring is a methodology that members of ŁKDFN view as necessary and pertinent to ensure the continual safety and security of the land base
    - Rooted in the balance between job creation and land destruction, community-based monitoring offers a means to engage community members while enhancing ecological sustainability

4.1 LKDFN Comments on the Extended Care and Maintenance Plan V2.0 (XII)

- Culturally Appropriate Approaches to Reclamation
  - A key component for knowledge dissemination was to identify means for culturally appropriate approaches to reclamation. This extends beyond the dominant paradigm surrounding the highly technical domain of reclamation practices and presents a socio-ecological approach to reclamation

4.1 LKDFN Comments on the Extended Care and Maintenance Plan V2.0 (XIII)

- Technical review of the Extended Care and Maintenance Plan V2.0
  - Numerous comments, questions and concerns provided for four themes: waste management, monitoring, environmental sustainability and water quality

5. Stakeholders' Update

- DFO commented De Beers' Notification of Final Closure and Request to not file an ICRP, on January 5, 2018
- ENR, Lands' Inspector commented De Beers' Notification of Final Closure and Request to not file an ICRP, on January 15
- ECCC commented De Beers' Notification of Final Closure and Request to not file an ICRP, after due date (January 15)

5.1 DFO Comments on De Beers' Notification of Final Closure and Request to not file an ICRP

- DFO has reviewed De Beers Snap Lake Mine Extended Care and Maintenance Plan Version 2.0 in accordance to its mandate and has no comments at this time

5.2 ENR Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (I)

- ENR supports the position of De Beers to delay submission of a Closure Plan until 2019 when a FCRP will be submitted

5.2 ENR Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (II)

- ENR is concerned regarding the potential for impacts to groundwater or surface water if the underground receives inputs of poor quality surface water on a regular basis
  - ENR recommends De Beers provide additional information on the nature of the connection between the underground mine and Snap Lake. This information should include discussion regarding meeting closure objective UM2 (i.e. underground mine should not contribute to the contamination of ground or surface water), flow pathways, travel times, dilution factors, etc.

5.2 ENR Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (III)

- ENR recommends that the closure criteria for the underground mine should be developed as a priority
- ENR recommends that De Beers confirm that the existing SNP network will be sufficient to monitor achievement of the underground mine closure objectives and criteria. If not, De Beers should indicate what additional stations will be required, and when they will be installed and activated

5.2 ENR Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (IV)

- ENR recommends that the results of evaluations, such as the need for refining the design and construction of spillways related to the North Pile, should be communicated to stakeholders through the Water Licence Annual Reports
- ENR recommends that specific monitoring frequencies (e.g. daily, weekly, monthly, etc.) should be provided in the plan

5.2 ENR Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (V)

- De Beers indicates that they will establish, wherever possible, a remote telemetry communication network to augment visual inspections. Details are not provided on what this system would involve and ENR is uncertain how it would operate in regards to several specific referenced activities such as monitoring ice and water levels in sumps and monitoring equipment/machinery leaks
- ENR recommends that De Beers provide additional information on any remote monitoring systems prior to them being approved to replace a physical presence at the site

5.3 Inspector's Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (I)

- The submission of an updated ICRP is past due. An updated ICRP does provide value with regards to closure research (lessons learned to date, identification of data gaps) and closure activities which are or should be investigated and/or addressed in the interim (before submission of a final closure plan). To delay the submission of such information negates the value provided by an update (in a timely manner) and also negates the opportunity for input from reviewers
  - **File the updated ICRP by the established de line**

5.3 Inspector's Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (II)

- Zero occupancy until "just prior to the following freshet" seems to be an avoidable risk. In the Inspectors opinion the determination of the onset of freshet is imprecise at best & highly speculative. The risk of leaving site-preparation activities until its too late (i.e., freshet has started) is avoidable
  - Don't play chicken with the timing of the onset of freshet. i.e., have staff pro-actively involved in pre-freshet preparation activities well in advance of the predicted timing of freshet (or keep occupancy le[illegible]s at sufficient levels to ensure such activities can be ongoing/proactively done through the preceding [illegible]ter)

5.3 Inspector's Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (III)

- Will accomodation of 25 suffice to cover projected future maximum occupancy needs (i.e., during future winter road construction periods)?
- Given the stated request to transition to "zero permanent occupancy…with a team physically visiting the site at monthly intervals", how does De Beers propose to meet LUP condition 26(1)(m) clause 52, *"the Permittee shall: (a) examine all Fuel Storage Containers and Tanks for leaks* ***a minimum of once per day*** *and (b) repair all leaks immediately"*?

5.3 Inspector's Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (IV)

- Please specify which equipment, consumables, and/or surplus facilities will be considered for removal (so that the Inspector can report on the status of these initiatives, or lack there-of)
- In addition to the LUP discussed earlier (26(1)(m), Clause 52) regarding daily Fuel Storage Tank inspections, the proposed monthly visits seems to conflict with the required "fortnightly documentation of routine surveillance of dams at Snap Lake to identify and measure cracks, sloughing, and seepage" identified in the 2017 Geotechnical Inspection of the North Pile Facility & Water Mgt. Pond Dams

5.3 Inspector's Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (V)

- Is De Beers confident that this surveillance equipment will provide complete coverage of fuel storage facilities? Would video surveillance detect drips from valves or pipelines? What if they are covered with snow or frost? Does this coverage provide a viable surveillance option which meets or exceeds the capabilities of inspections which can be made when staff are physically at these facilities?

5.3 Inspector's Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (VI)

- The Inspector shares in the concerns expressed by ENR for the ECMP (v.1), comment 2, which notes that the use of language such as "on a regular basis", "as necessary", and "when required" leaves the anticipated frequency of inspections/proactive management activities unclear. In order to perform effective compliance assessment/ manage environmental risks, the Inspector requires some quantifiable (measurable) compliance criteria for road, ditches and culverts (as well as sump & pond management). Otherwise, confirmation of compliance &/or determiniations of non-compliance will rest on the subjective assessment of the Insp
(which is not optimal)

5.3 Inspector's Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (VII)

- If the sump approaches or overtops crest elevation during a proposed period of zero occupancy, how will De Beers detect that increase? How long does De Beers estimate it will take (at a maximum) to detect crest elevations which are approaching or exceeding crest elevations? What is the expected response time to spills identified via remote monitoring (best case scenario)?
- How can De Beers take preventative action to resolve the capacity issue before the sump overtops/a spill occurs if no-one is physically present for up to 30 days?

5.3 Inspector's Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (IX)

- Describe how De Beers will ensure it responds quickly to contain and control spills (if staff are not physically present for up to 30 days at a time)

5.3 Inspector's Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (X)

- The revision table of the Spill Contingency Plan does not assist the reviewers at all in assessing where new content has been input and what that new content is. The format followed in ECMP version 2 (where the text which has changed in comparison to the previously approved plan, ECM 1.1, has been highlighted in yellow). This same practice should have been implemented for all revised plans submitted as part of this request (the Spill Contingency Plan, Waste Mgt. Plan, Water Mgt. Plan, etc.)

5.3 Inspector's Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (XI)

- Update wording throughout the Plan to account for current and future expectations (discounting plans and activities which have already occurred, or will no longer be occurring)
  - Flooding of the underground
  - Re-establishment of operations

5.3 Inspector's Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (XII)

- Discussion on the WTP, Water Treatment, and Water Balance are now quite dated. Content needs to be revised to reflect current WTP infrastructure and the current water balance situation

5.3 Inspector's Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (XIII)

- Sumps will be maintained "as necessary"; Ice accumulation in sumps "requires action"; Water and Ice must both be "managed" in sumps; Ice formation must also be "monitored and removed" in the critical flow ditches. Define what each of these looks like, so the Inspector can confirm and report on whether or not this has occured. In other words: (1) How will De Beers determine sump maintenance is necessary? (2) At what point will water and ice accumulations in sumps "require action", and what will that action be? (3) What will monitoring of critical flow ditches entail, who will perform that task and how/when? Which flow ditc
are deemed critical and subject to this action?

5.3 Inspector's Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (I)

- Clarify the paragraph in Section 3.2.1 of the Water Management Plan to account for the actual intent of the "Water Management Pond" specified in the EA, ie, to intercept runoff from the WMP watershed (and NOT runoff from the North Pile) & acknowledge that seepage past from the WMP (Dam 1) should meet/exceed WTP effluent EQC

5.4 ECCC Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (I)

- ECCC recommends the Proponent provide additional information on the proposed remote monitoring being undertaken, including a description of the location of video surveillance to ensure that all high risk areas are captured by surveillance in the event that an issue arises. This discussion may include development of a Remote Monitoring Plan

5.4 ECCC Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (II)

- ECCC recommends the Proponent describe the anticipated supplemental water treatment system, including treatment process, target contaminants and expected treatment efficiency

5.4 ECCC Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (III)

- ECCC recommends the Proponent clarify whether this underground contingency refers only to the flooding of the underground which has already been completed or if additional underground contingency still exists for future water management

5.4 ECCC Comments on De Beers' Notification of Final Closure and Request to not file an ICRP (I)

6. Agency's Activities

- SLEMA comment letter on De Beers' Notification of Final Closure and Request to not file an ICRP was sent to the MVLWB on January 15, 2018
- SLEMA staff attended the Waste Rock Workshop organized by IEMA on January 18

7. SLEMA Reviews

- Notification of Closure at the Snap Lake
- Extended Care and Maintenance Plan (Final Phase)

7.1 Notification of Closure at the Snap Lake

- Submitted on December 14, 2017
  - "As a result of the on-going evaluation of Snap Lake Mine since 2015, De Beers will now begin preparation for the Final Closure of the Snap Lake Mine. De Beers intends to file a Final Closure and Reclamation Plan in 2019 after conducting additional engagement with our community partners and finalization of engineering studies"
  - "De Beers requests to not file an ICRP in January of 2018 but will instead focus efforts on completion of FCRP and licence application for 2019"
  - Updated Extended Care and Maintenance Pla attached

Comments from the Environmental Analyst

- No concerns are raised, and it is acceptable that De Beers requests to not file an ICRP in January of 2018 but will instead focus efforts on completion of FCRP and licence application for 2019

7.2 Extended Care and Maintenance Plan (Final Phase)

- Submitted on December 14, 2017
  - Version 2.0, as per the interim approval letter on June 22, 2016
  - The scope of activities to be undertaken during this final phase of ECM will maintain compliance with Water Licence and Land Use Permit until such time as the final closure plan and licence application are filed and approved by the MVLWB
  - Updated Spill Contingency Plan, Emergency Response Plan, Waste Management Plan and Water Management Plan attached as appendices

Summary of Proposed Changes (I)

- "De Beers intends to transition the site to zero permanent occupancy each year from near freeze-up to just prior to the following freshet during the Extended Care and Maintenance phase. To ensure compliance with De Beer's water licence and Land Use permits, a team will physically **visit the site at monthly intervals** during this period or as required to collect monitoring samples and conduct inspections. In addition De Beers has installed **video surveillance equipment** to provide continuous surveillance from Gahcho Kue Mine during periods that the site is not occupied."

Summary of Proposed Changes (II)

- "De Beers has recently entered into a long term contract with the Det'on Cho Corporation to provide site maintenance and operations during the period that the site will be staffed – i.e. from just prior to freshet to near freeze-up each year. There will also be the ability to **mobilize a maintenance crew during the period of non-occupancy** should issues be detected by either the video surveillance monitored at the Gahcho Kue Mine or by the inspection team during monthly visits."

Summary of Proposed Changes (III)

- Flooding of the underground mine commenced in January 2017 and the underground workings of the mine are currently not maintained in a dry condition
- Access to the underground workings have been closed with physical barriers preventing inadvertent access through the main and conveyor portals have been erected
- **Reopening of the underground workings is no longer an option under investigation**

Summary of Proposed Changes (IV)

- The footprint of the existing camp has been reduced and sections of the plant were mothballed. The camp is set up to accommodate up to 25 persons to support the on-going requirements of extended ECM
  - When no winter activities are planned the camp is staged to open prior to freshet each year for de-winterization and to prepare for spring and summer activities that include but are not limited to Freshet Management and North Pile related work
  - When no winter activities are planned the camp shutdown and winterization of the infrastructure is planned to occur in near the freeze-up period (Oct[illegible]er)

Summary of Proposed Changes (V)

- Throughout Extended Care and Maintenance De Beers will continue to assess the Snap Lake Mine for:
  - Further optimization of extended care and maintenance activities (i.e. Passive Water treatment and monitoring of the site using wireless sensor information to provide on line access and expanded coverage of key parameters during zero vacancy periods);
  - To actively seek to reduce the impacts to the environment and advance progressive reclamation by removing non-essential infrastructure that will de[illegible]de over time, and;
  - To prepare for the final Closure of the Snap Lak[illegible]ne

Comments from the Environmental Analyst (I)

- Monthly site visits by De Beers staff, combined with remote monitoring arrangements (video surveillance, remote sensing, etc.), as well as the capability to mobilize a maintenance crew during the period of non-occupancy, may work for the period of Extended Care and Maintenance
  - It is requested that De Beers develop detailed check list for monthly site visits, and report results of site visit and remote monitoring in the SNP Monthly Report for stakeholders' review

Spill Contingency Plan

- The scope of the Plan is to describe how De Beers will manage spills throughout the period of Extended Care and Maintenance
  - Updated to reflect the proposed extended care and maintenance conditions at Snap Lake Mine, including periods of occupancy and periods of camp vacancy and updated organizational structures

Emergency Response Plan

- This Plan is intended to address fire, surface emergencies, medical emergency, accidental releases – spills, natural disasters, and loss of life
  - Response to any environmental emergency or fire during times of zero occupancy, will be triggered via surveillance alarm and action will be initiated by Gahcho Kue security and will then be handled according to the Emergency Response Team and/or spill contingency plan with a response team mobilized as soon as practically possible

Comments from the Environmental Analyst (II)

- No concerns are raised for Spill Contingency Plan and Emergency Response Plan

Waste Management

- The Plan describes how all waste streams associated with the Mine are managed. The Plan includes a detailed description on processes for handling all waste streams not specifically described in other management plans

Comments from the Environmental Analyst (III)

- It is stated in Section 1.3 that due to mechanical issues with filter media in the new sewage treatment plant, housed in the Utility building, De Beers continued to use the old Sewage Treatment Plant (STP) until the Extended Care and Maintenance Plan took effect, necessitating a smaller plant to be built.
- It is stated in Section 5.1 that the smaller wastewater treatment plant (STP3) has been installed and will be commissioned in 2018.
- The information is helpful to understand how De Beers deals with sewage issue from the operation period to extended care and maintenance period

Comments from the Environmental Analyst (IV)

- However, the information for water treatment is inadequate
- In the Revision History (page iii), it is stated that water treatment capacity volume was revised in Section 6, but no revised data is found in Section 6 (page 30 to 33. It is not appropriate to put Potable Water Treatment Plant (Section 6.1) into Waste Management Plan

Comments from the Environmental Analyst (V)

- Modular Water Treatment Plant has been used during Care and Maintenance, but no information is available in Section 6
- The water treatment solution described in the *Technical Memorandum: De Beers Canada Snap Lake Mine Water Management Strategy* dated September 4, 2017 is not mentioned in Section 6, either
  - Similarly detailed information on the Modular Water Treatment Plant and the new water treatment train as STP3 is requested

Water Management (I)

- All perimeter sumps and the water management pond are currently being kept to the lowest level possible, with no pumping planned during the period from freeze-up to just prior to freshet
  - The processed kimberlite facility (North Pile) has been dormant for 20 months. As such, continued inflow into the sumps are not expected to impede on freeboard during time of camp vacancy

Water Management (II)

- The volume of water that is expected to continue to drain into the sumps adjacent to the North Pile will be allowed to freeze in place
  - Visual observations will continue during the planned monthly site visits
  - In the event that sump levels are seen to be rising and reach a level beyond safe capacity, a maintenance crew will be mobilized to start de-icing to maintain safe levels within the sumps

Water Management (III) - Sump Water/Ice Level Monitoring

- The North Pile and associated sump water/ice levels are monitored by a combination of:
  - Survey reports;
  - Wireless instrumentation network;
  - Field/visual checks (level poles, marker pylons/rocks, etc.); and
  - Wireless Sensing (telemetry, Visual, and pressure sensors)

Comments from the Environmental Analysts (VI)

- Section 2.1.5 Sewage Treatment should be consistent with Section 5 of Waste Management Plan
- Section 2.1.9 Water Treatment Plant should be consistent with revised Section 6 of Waste Management Plan

Comments from the Environmental Analysts (VII)

- It is stated in page 31 (Section 3.1.3, Extended Care and Maintenance Plan) that optimization of returning high-concentration surface water to the underground workings via existing water management infrastructure
- What, when and how De Beers will trigger and stop pumping?
  - It is noticed that if the water elevations at the fresh air raise and conveyor portal are above the water elevations of Snap Lake, there will be hydrological pressure to move water from underground to Snap Lake. That will be inappropriate and should be corrected
  - The water levels at those locations should follow the management practice of those perimeter sumps, ensuri wate levels lower than that in Snap Lake