



September 2015 Environmental Update for SLEMA Board

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September 30, 2015

Outline

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



Acronyms

- AANDC – Aboriginal Affairs and Northern Development Canada
- AEMP – Aquatic Effects Monitoring Program
- ARD – Acid Rock Drainage
- DFO – Fisheries and Oceans Canada
- CCME – Canadian Council of Ministers of the Environment
- CEQG – Canadian Environmental Quality Guidelines
- EC – Environment Canada
- ENR – Department of Environment and Natural Resources, GNWT
- EQC – Effluent Quality Criterion
- GNWT – Government of the Northwest Territories
- MVLWB – Mackenzie Valley Land and Water Board
- PK – Processed Kimberlite
- SLEMA – Snap Lake Environmental Monitoring Agency
- SNP – Surveillance Network Program
- 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 – August 2015

- Production rate: 89.7% of its capacity (87,573 tonnes of kimberlite processed)
- 3,588 m³ of water withdrawn from Snap Lake
- 1,588,742 m³ of treated water discharged into Snap Lake
- 72,438 tonnes of coarse reject and 49,415m³ of slimes deposited in the North Pile
- No reportable spills
- Water sampled in 16 monitoring stations
 - The monthly average for all parameters met compliance except for Faecal Coliform at SNP 02-16i on August 10



1.2 Spill Reporting in September 2015

- No spill reports received in September 2015



1.3 Notification of Exceedance – Total Suspended Solids (TSS)

➤ Dated August 25, 2015

- Results of the 6-day legal sample on July 29, 2015 indicate that Total Suspended Solids (TSS) concentration (16.3 mg/L) in the sample exceeded the water license maximum concentration of any grab sample discharge criteria of 14 mg/L
- At this time, no cause can be attributed to the exceedance and therefore no corrective action is being proposed at this time
- De Beers concludes that the release was not deleterious to aquatic life



Inspector's Response

➤ Dated September 2, 2015

- The Inspector is satisfied that proper sampling procedures were being followed and that this exceedance is an anomalous event and does not represent a issue with the Water Treatment Plant or continuous mine effluent
- The Inspector notes a delay of 7 days between lab report and notification which contravenes Part H, Item 5b) of Water Licence MV2011L2-0004
 - De Beers is required to report any unauthorized discharge immediately after the details are available



1.4 Notification of Annual Geochemist Field Inspection

- Date September 2, 2015
 - Two week notification
 - Annual Geochemist Field Inspection will be carried out during the week of September 14, 2015



1.5 De Beers' Responses to 2014 AEMP Annual Report Approval

➤ Dated September 9, 2015

- The update Snap Lake site and lake models are to be submitted in Quarter 2 2016 to align with the submission of the North Pile Expansion Application Package
- De Beers will incorporate a discussion of potential implications of large zooplankton to higher trophic levels in the 2015 AEMP Annual Report to be submitted in May 2016
- The Downstream Lakes Special Study is superseded by the new requirement for the Downstream Water Courses Special Study



1.6 Snap Lake Downstream Watercourses Special Study

- Submitted on September 14, 2015
 - De Beers revised the DSW SS to include the detailed discussion on power analysis
 - No other changes aside from the Board request were made to this document



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

➤ Dated on September 24, 2015

- De Beers concluded that on-site (in-line) chloride (Cl-) measurements are unreliable, and that in-line electrical conductivity (EC) provides much more reliable operational monitoring data
- De Beers requested 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”*



2. Inspection Update

- Inspector – Jamie Steele
- Water Licence and Land Use Permit Inspections
 - No inspection reports received in September 2015



3. Regulators' Update

- MVLWB
- Department of Lands
- Department of Environment and Natural Resources



3.1 MVLWB's Update (I)

- MVLWB staff confirmed, on September 4, 2015, that
 - “the requested changes as outlined in the Board’s decision letter dated August 20, 2015 have been addressed. Therefore, the Nitrate Exceedance Memo can be considered approved and the North Pile Management Plan has been updated accordingly.”
- MVLWB staff confirmed, on September 15, that
 - “the requested changes as outlined in the Board’s decision letter dated July 23, 2015 have been addressed. Therefore, the Downstream Watercourses Special Study Plan can be considered approved.”



3.1 MVLWB's Update (II)

- Distributed, on September 16, 2015, the Water Licence Amendment De Beers requested on December 20, 2013 after ENR Minister approved it
- Invited reviewers to submit comments on SNP – TDS Correlation with Inline Parameters
 - Due on October 15, 2015



3.2 Department of Lands

- Responded on August 28, 2015, to the MVLWB's Information Request dated August 21, 2015, regarding the status of the reclamation security held by GNWT
 - GNWT held a total of \$21,035,671.00 from De Beers Canada



3.3 Department of Environment and Natural Resources (I)

- Provided the following directions to De Beers for the format and Table of Contents of Environmental Agreement Annual Report on September 17, 2015
 - Formatting: the format of the report shall be kept; table of contents covers all the requirements from Environmental Agreement Article 10.1.
 - Editing: more attention when editing, correct typo mistakes, missing references, paragraph construction.
 - Content: the report is well formatting, 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.
 - Table 2.1, should be simplified and not only be a “copy from Section 4 (example in a separate word document).



3.3 Department of Environment and Natural Resources (II)

- 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.
- 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.
- 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.



4. Aboriginal Update

- No comments received in September 2015



5. Stakeholders' Update

- CIMP Proposed Investigation on Changes to Plankton Communities in Waterbodies Receiving Diamond Mine Effluent



5.1 CIMP Proposed Investigation on Changes to Plankton Communities in Waterbodies Receiving Diamond Mine Effluent

- The NWT Cumulative Impact Monitoring Program (NWT CIMP) is proposing to conduct a study in partnership with Queen's university to investigate the reported changes to plankton communities in waterbodies receiving diamond mine effluent
 - The project will incorporate analyses of water chemistry data to determine if there are correlations between various effluent constituents and changes to the plankton communities
 - Both scientific and plain language reports will be distributed by April 2016
- CIMP asked three monitoring agencies to support this project on September 15, 2015
 - SLEMA expressed support in a letter dated September 24, 2015



6. Agency's Activities

- Fish Tasting event took place at the Mine site on September 10, 2015
 - Representatives from YKDFN, LKDFN and NSMA attended the fish tasting event, but no representatives from Tlicho
 - SLEMA Board Chairperson Ms. Rachel Crapeau observed the fish tasting event



7. SLEMA Reviews

- Freshwater as a Mitigation Measure
- Report on Correlation Between On-Site and Laboratory Measurements of Chloride and TDS

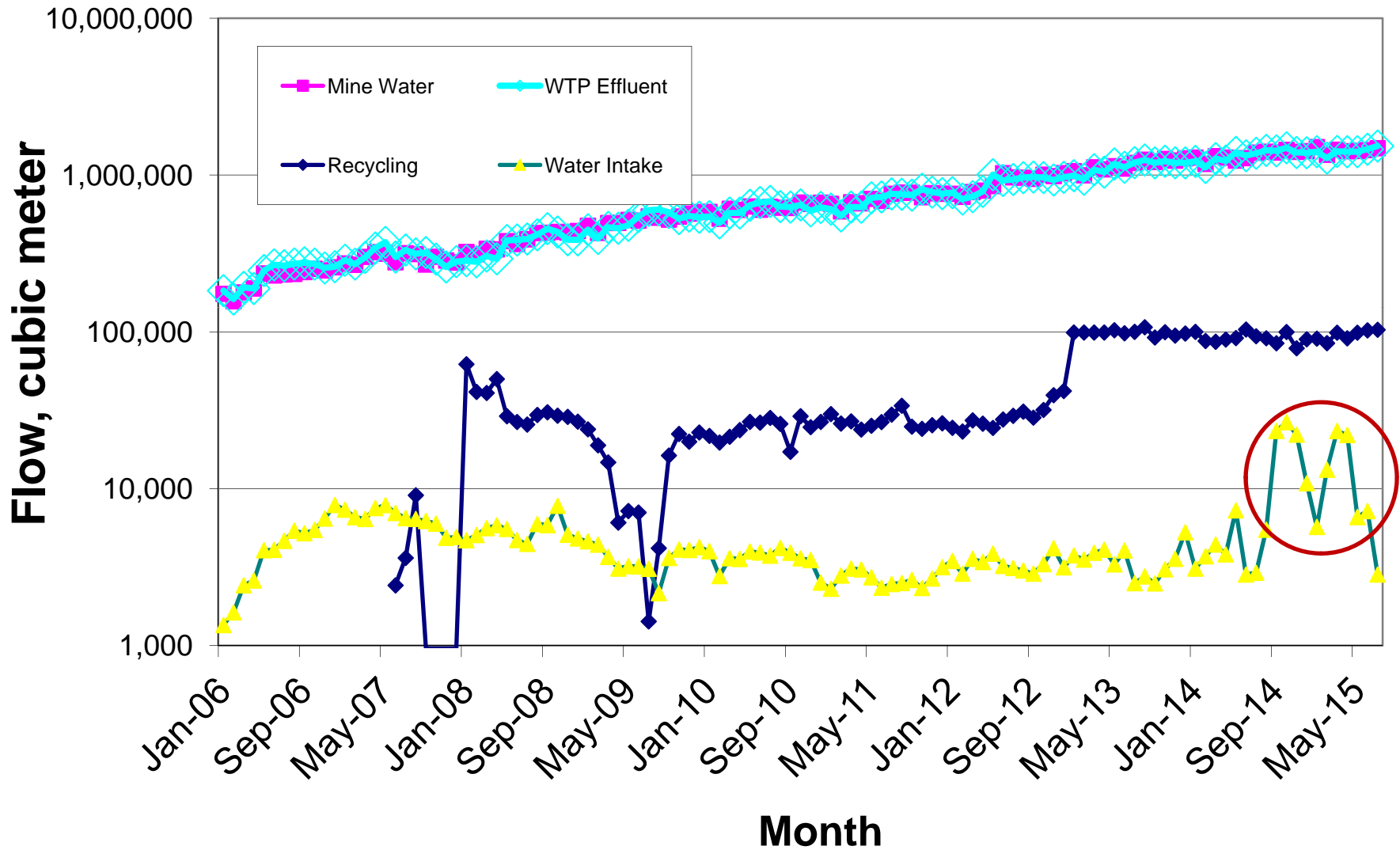


7.1 Freshwater as a Mitigation Measure

- The MVLWB clarified the direction provided in the February 12, 2015 letter regarding the use of freshwater as a mitigation measure, on June 23, 2015
 - “The Board approved the temporary use of freshwater as a mitigation measure until the December amendment application has been signed by the Minister. At which point De Beers can no longer use freshwater as a mitigation measure.”



Water Flows at the Mine



Comments from the Environmental Analyst

- The water intake amount was back to normal range in July 2015
 - De Beers appeared to stop using fresh water as a mitigation measure



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

- Historical instrument measurements of in-line Cl⁻, compared to laboratory analyses have clearly demonstrated a poor correlation and are considered unreliable
- The preferred method to manage effluent quality at Snap Lake Mine is by in-line electrical conductivity (EC) measurement
 - De Beers requested 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”*



The data suggests that there is nearly no relationship between the inline chloride analyzer readings and laboratory chloride results, and there is only a weak correlation between laboratory chloride and inline conductivity

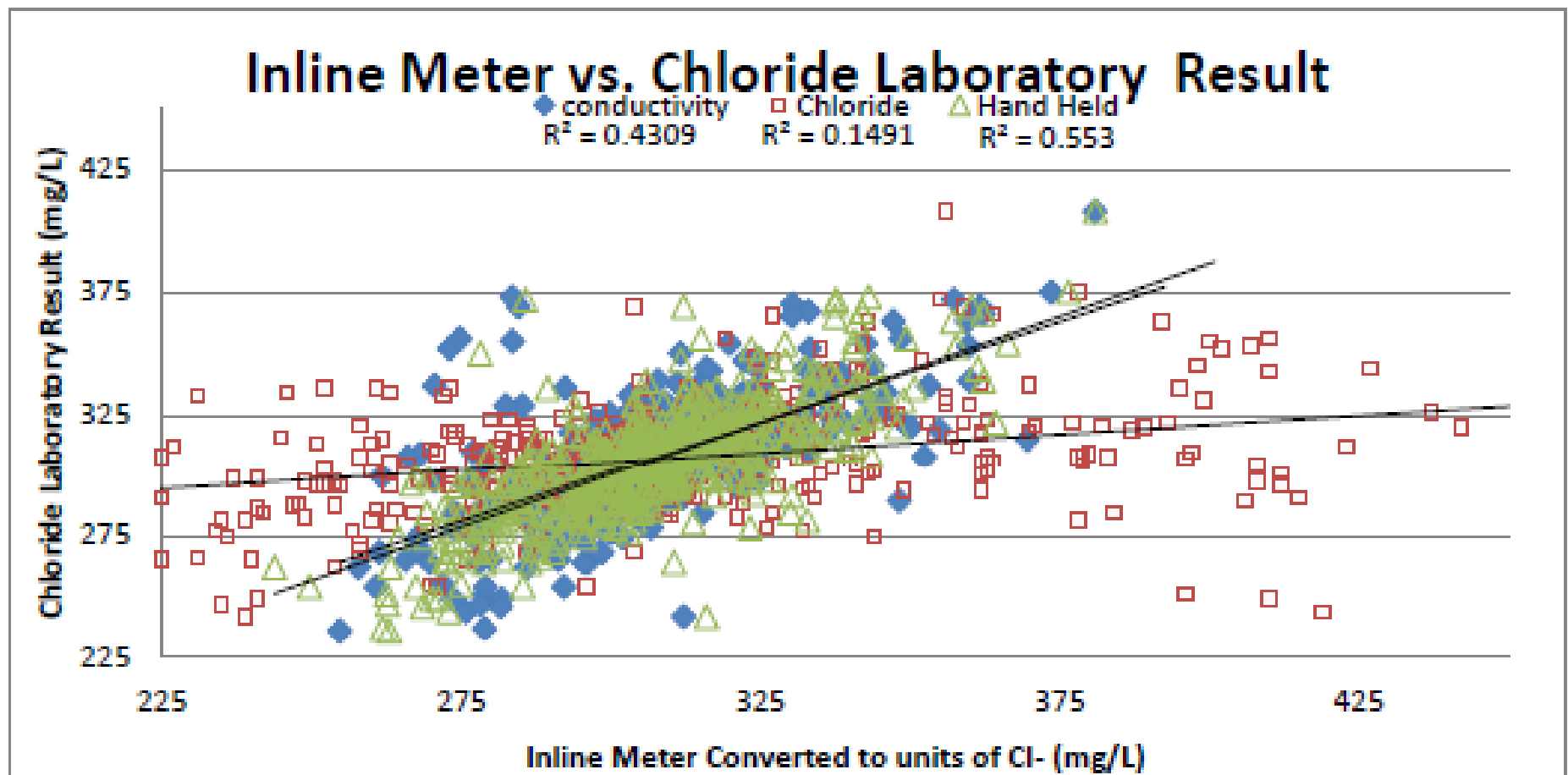


Figure 1: Handheld & In-line to Measured Chloride relationships

There is a strong correlation between TDS and EC. It is using this relation that Snap Lake Mine is able to make operational management decisions at the Water Treatment Plant

Handheld EC:TDS relationship (July 2015): $TDS = 0.5034 XEC + 22.018$

In-line EC:TDS relationship (July 2015): $TDS = 0.567XEC + 70.619$

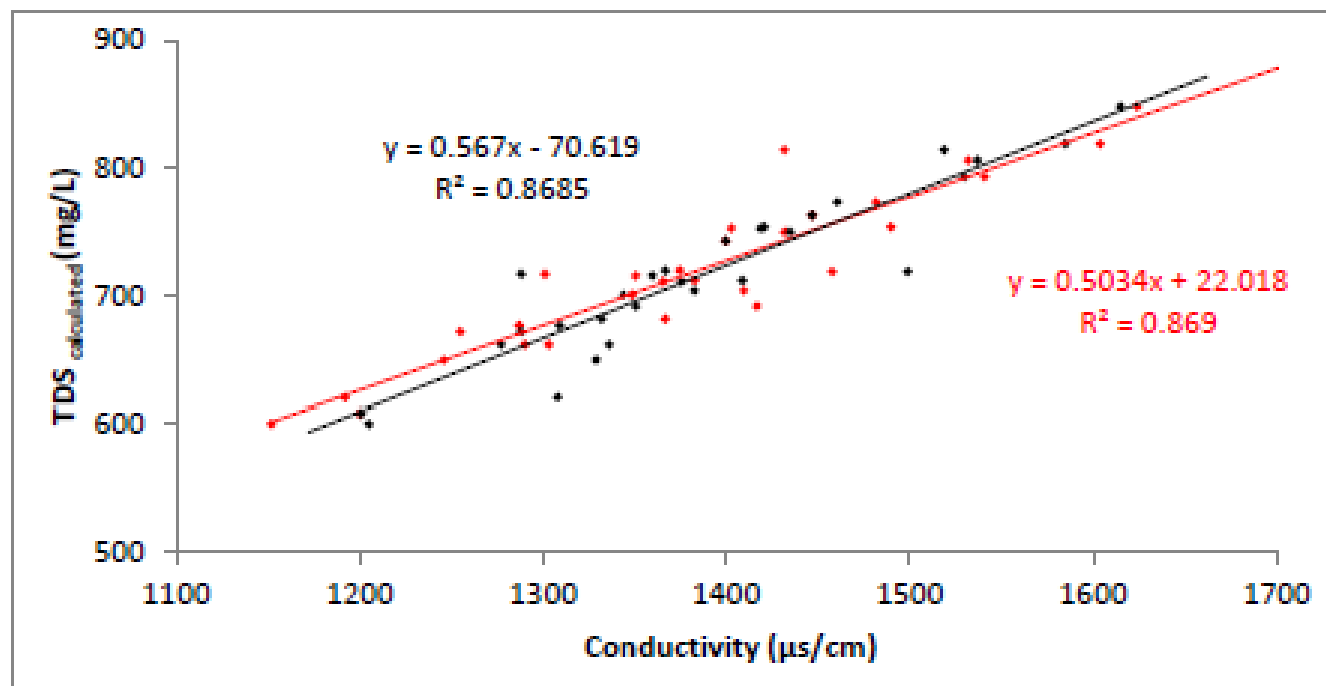


Figure 2: Handheld & In-line EC:TDS relationships



Comments from the Environmental Analyst

- The statistical correlation between on-site (in-line and handheld) measurements and laboratory calculated Cl⁻ and TDS is well conducted
 - It is not appropriate to base operational decisions on the in-line chloride analyzer, nor to monitor operational compliance on this basis
 - In-line electrical conductivity is a better indicator for operational control
- De Beers' request is justifiable



8. Water Licence Amendment Application

- The Minister of ENR, on September 10, 2015 approved the water licence as recommended by the MVLWB on June 19, 2015

