



**Snap Lake Environmental Monitoring Agency**  
**Main Floor, Lahm Ridge Tower**  
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Marc Casas  
Regulatory Officer  
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P.O.Box 2130  
Yellowknife, NT X1A 2P6

File: Water Licence MV2011L2-0004

March 6, 2015

**Re: Amendment Application – TDS Calculated vs. Measured**

Dear Mr. Casas,

Snap Lake Environmental Monitoring Agency (SLEMA) conducted some analysis of the data De Beers provided to ENR on January 15, 2015 (IR#4), and sent the findings to the MVLWB via e-mail on January 29, 2015. The MVLWB posted the findings on the Online Review System.

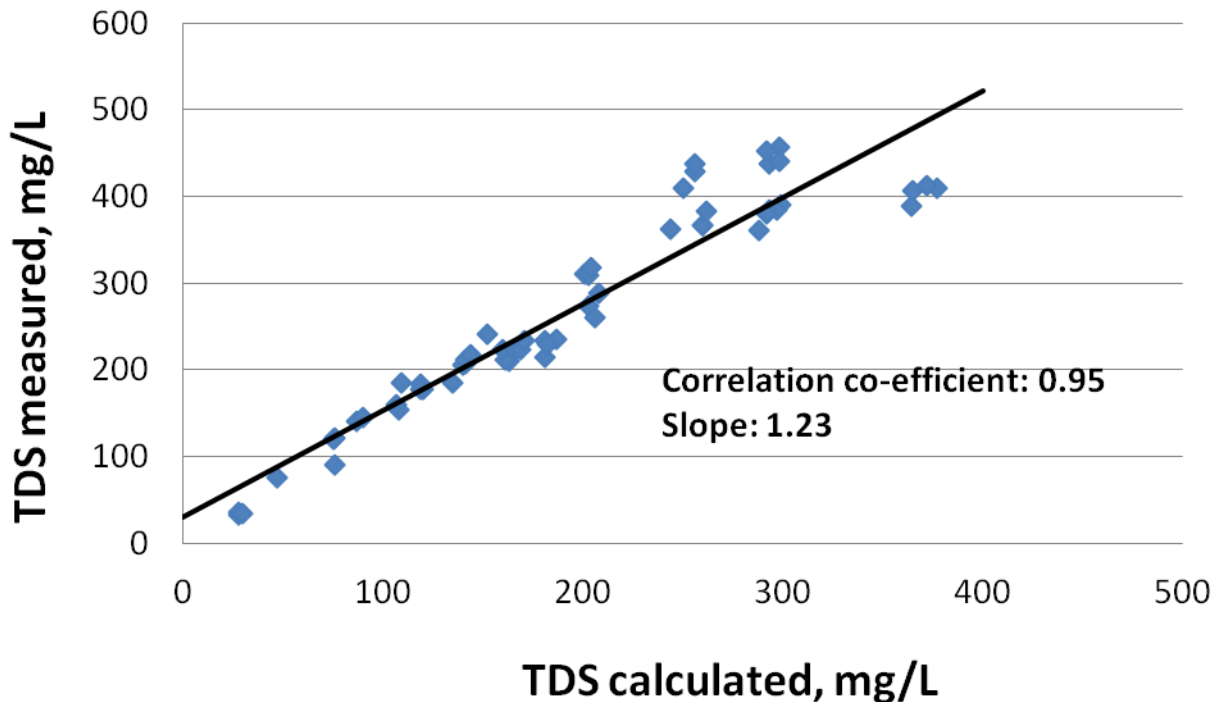
SLEMA analysis shows that there appears to be a linear correlation between TDS measured and TDS calculated with a slope of 1.23, an intercept of 29, and a correlation coefficient of 0.95, at SNP 02-20 in Snap Lake.

To make the discussion simple, the intercept is ignored. SLEMA believes that, if the TDS aesthetic objective set by Health Canada is TDS measured, then there might have some issues with De Beers proposed SSWQO of 1000 mg/L.



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## TDS measured vs. TDS calculated at SNP 02-20



There is a statement in Health Canada's drinking water guidelines. De Beers used it in some of its presentations.

- *"In an extensive, well-controlled mineral taste study conducted recently in California, the following relationship was developed between the perceived taste quality of a water supply and its TDS content: excellent, less than 300 mg/L; good, 301–600 mg/L; fair, 601–900 mg/L; poor, 901–1200 mg/L; and unacceptable, greater than 1200 mg/L."*

Source: [http://www.hc-sc.gc.ca/ewh-semt/alt\\_formats/hecs-sesc/pdf/pubs/water-eau/taste-gout/taste-gout-eng.pdf](http://www.hc-sc.gc.ca/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/water-eau/taste-gout/taste-gout-eng.pdf)

De Beers has been using TDS calculated for its reports, and the Water Licence also set TDS limit of 350 mg/L with TDS calculated.

The measured TDS may be 1230 mg/L if TDS calculated is 1000 mg/L in Snap Lake. That will be in the range of unacceptable levels, based on the above statement.



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De Beers, on February 20, 2015, responded to SLEMA's comments with an in-depth analysis in a Technical Memorandum by Golder Associates.

SLEMA appreciates De Beers' responses, and understands that De Beers acknowledged that there was potentially inconsistent comparison to the Health Canada's Aesthetic Objective and Classifications, because "TDS concentrations in the panel study (Bruvold and Ongerth 1969) do appear to be measured rather than calculated TDS".

It is agreed that calculated TDS remains the appropriate indicator of TDS in Snap Lake. However, the comparison should be appropriate and consistent.

It is appreciated that, in De Beers' responses to Interveners' Recommendations related to Measure 1d (Table 2-3, page 46-47), De Beers appropriately compared the predictions with baseline data by using calculated TDS concentrations. However, clarification is still needed for potentially inconsistent comparison of De Beers predictions related to Suggestion 2 to the Health Canada's Aesthetic Objective (500 mg/L).

The MVEIRB required that Snap Lake water quality be back to drinking water guideline (Aesthetic Objective, 500 mg/L) within 5 years. De Beers predicted that it would be within 4 (lower bound) to 7 years (upper bound), based on calculated TDS.

The 500 mg/L of measured TDS is equivalent to 407 mg/L of calculated TDS, based on the linear correlation between them, which means the period of Snap Lake water quality back to the Aesthetic Objective will be a few more years longer than De Beers predicted.

If you have any questions whatsoever please feel free to contact Philippe di Pizzo at 867-765-0961 / [exec@slema.ca](mailto:exec@slema.ca).

Sincerely,

Original signed by

Philippe di Pizzo  
Executive Director