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April 1, 2014

File: L020

Simon Toogood
Mackenzie Valley Review Board
200 Scotia Centre
Box 938, 5102-50th Ave
Yellowknife, NT
X1A 2N7

Rebecca Chouinard
Mackenzie Valley Land and Water Board
PO Box 2130
Yellowknife, NT
X1A 2P6

Dear: Mr. Toogood and Ms Chouinard:

**Re: De Beers Canada Snap Lake Mine EA1314-02 Water License Amendment
Application MV2011L2-0004 Supplemental Information**

On March 28, in its Reasons for Decision regarding the scope of the Environmental Assessment of the Snap Lake Water Licence Amendment Application, the Mackenzie Valley Review Board (MVRB) indicated that De Beers Canada Inc. (De Beers) will be required to provide information to meet the requirements of s.117 of the *Mackenzie Valley Resource Management Act* (MVRMA) as they related to the proposed amendments to the Snap Lake Mine's Effluent Quality Criteria (EQC) within the scope of the assessment.

De Beers will provide this information as a Supplemental Information Report in advance of the Technical Sessions. This supplemental information will include items outlined in the attached annotated Table of Contents, and will be provided on Friday, April 11, following the completion of model runs required to address certain questions posed by the Mackenzie Valley Land and Water Board in its comments of March 14.

We request approximately 45 minutes to present this supplemental information during the Technical Sessions, specifically the first day of the sessions, April 15. De Beers believes that a presentation will assist reviewers in understanding the information provided on April 11 and will also provide the basis for productive and useful discussion during the Technical Sessions.

In addition, De Beers met with regulators and affected Aboriginal organizations on March 20 to present an overview of the amendments proposed in the application related to EQCs. Please find attached a presentation and relevant excerpt of the meeting notes. During the

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meeting, De Beers committed to summarizing the proposed amendments to the EQCs in plain language. A Plain Language Summary of the proposed amendment to the EQCs will be provided by April 4.

If you have any questions in response to the foregoing, please do not hesitate to contact the undersigned by phone at (867)766-7331 or email at erica.bonhomme@debeersgroup.com.

Sincerely,

DE BEERS CANADA INC.



Erica Bonhomme
Manager, Environment
Snap Lake Mine

Attachments

Snap Lake Water Licence TDS Amendment Environmental Assessment EA201314-02

Supplemental Information

Draft Annotated Table of Contents

11 April 2014

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1.0 INTRODUCTION

1.1 Objective of the Supplemental Filing

- The Mackenzie Valley Review Board (MVRB) is conducting an environmental assessment (EA) of a development proposal.
- MVRB, in conducting an EA of a development proposal, must consider the factors listed in section 117. (2) of the *Mackenzie Valley Resource Management Act*.
- De Beers is hereby providing supplemental information to assist MVRB in its consideration specifically of those factors during the EA process.

1.2 Scope of the Development (as per March 28, 2014 MVRB Scoping Decision) and Supplemental Information

- Re-summarize the scope of the EA as determined by the MVRB on March 28, 2014.
- Summarize supplemental material being provided relevant to this scope:
 - Updated water quality modeling predictions addressing comments received on the application March 14;
 - Accident and malfunctions related to discharge of total dissolved solids (TDS);
 - Cumulative effects of TDS in the Lockhart River watershed; and,
 - Alternatives to the Proposal.

2.0 UPDATED WATER QUALITY PREDICTIONS

- Updated water quality predictions corresponding to SSWQO as proposed in the application, with plots provided as noted in Response to Comments MVLWB 2, 8, and 11 for:
 - Snap Lake; and,
 - Downstream lakes;
- Technical Memorandum of modelling results provided in an appendix.

3.0 ACCIDENTS AND MALFUNCTIONS

- The objective of this section is to assess the environmental consequences from accidents or malfunctions in relation to discharge of treated minewater containing elevated concentrations of TDS as consolidated in the following key question:
- Key Question: What impacts will a potential accident or malfunction related to discharge of treated minewater containing elevated levels of TDS at the Snap Lake Mine have on the environment, specifically Snap Lake?
- This section will describe an accident or malfunction scenario related to discharge of mine effluent, such that effluent is discharged to the environment with higher concentrations of TDS than predicted.

- The results of water quality modelling will be presented, reflecting the extent of the plume and the volume of the lake that may potentially be affected.
- Potential environmental consequences of the accident or malfunction will be assessed according to a combination of magnitude of the effect, spatial extent, duration, and reversibility. The definitions of Environmental Consequence that were used in the 2002 Environmental Assessment of the Snap Lake Mine will be used for consistency.

4.0 CUMULATIVE EFFECTS

The objective of this section is to assess potential cumulative effects within the Lockhart River Watershed resulting from the discharge of treated effluent of concentration as proposed in the application:

- Key Question: What potential cumulative effects will the discharge of treated effluent with TDS concentrations equal to the SSWQO of 684 mg/L (i.e., the proposed average monthly limit) from the Snap Lake Mine have on water quality in the Lockhart River Watershed?
- The results of water quality modelling will be presented, evaluating the extent of the plume of treated effluent in lakes downstream of Snap Lake.
- Developments within the Lockhart River Watershed will be reviewed for the potential for interaction with Snap Lake Mine treated effluent release to the watershed. Other developments include De Beers Gahcho Kué Project, the Tibbitt-Contwoyto winter road, and the potential East Arm National Park (Thaydene Nene).
- A preliminary assessment indicates there is no overlap between developments releasing or having the potential to release TDS to the environment and, as such, there is no linkage between developments to perform a cumulative effects assessment. If an overlap is identified, then the magnitude, duration, geographic extent, and reversibility of potential effects to water quality will be presented.

5.0 ALTERNATIVES

The objective of this section is to outline the Alternatives to the proposed EQCs as applied for , including a discussion of pre-feasibility level assessment of mitigation options as presented in the TDS Response Plan.

- Key Question: What are the alternatives to the proposed changes to minewater effluent quality (EQC)s? .

6.0 REFERENCES

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Snap Lake Mine Planned Activities 2014

March 20, 2014 1:30 pm
Explorer Hotel, Yellowknife

The below excerpt is only in regards for the Water License only.

Attendance:

- | | |
|--|-------|
| • Marc Casas, Rosanna Nicol | MVLWB |
| • Paul Green, Rick Walbourne | AANDC |
| • Ricky Drygeese, Diane Bettsina, Angus Martin, Todd Slack | YKDFN |
| • Sean Whittaker | GNWT |
| • Wayne Langenhan, Ed Jones, Matt Hoover | NSMA |
| • Philippe di Pizzo, Zhong Liu | SLEMA |
| • Tom Unka | NWTMN |
| • Stanley Bouien, Robert Beaulieu | DKFN |
| • Alex Hood, Erica Bonhomme | DBCI |

Full Meeting Agenda:

- Overview of Key Projects under consideration for Q1-Q3 2014
 - Additional Fuel Storage
 - Contingency Surface Ore Stockpile
 - Design of the West Cell of the North Pile
- Overview of documents to support the Water License Amendment
- Planned Engagement for 2014

*Please see presentation for further details.

Water License Amendment Application:

- Process of Application
 - Submitted December 2013
 - Stakeholders comments on the application were provided March 14
 - De Beers responses due March 21
 - Technical Session April 14-15 (tentative at this time)
- Anticipate technical discussion of all aspects of the application; opportunity to present comments to the boards.
 - Technical Reports due May 21
 - Public Hearing June 5-6
 - Report of EA July 18

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- Change the water quality of water allowed to enter Snap Lake
- TDS is the measure of salts in the Water
 - This water is located within the rock and is released through mining activities
 - Snap Lake currently has a limit of 350 mg/L of TDS in the lake
 - The limit was not based on a study carried out but rather a value that De Beers thought that it would not exceed
- To meet the requirements of our current water license, site specific studies were carried out
- Effluent Quality Criteria are the values that are measured in the Water Treatment Plant prior to the Water being released to Snap Lake
 - These are the values currently under discussion

Planned Engagement for 2014:

- May 11 Stockholder Technical Visit
- May-June Proposed Community Visits
- July 7-18 Site Visits
- September Fish Tasting

Comments Table:

Question/Comments	DBC Response	How/Where Addressed
What does it mean if you are, "applying to change the discharge quality at Snap Lake?"	De Beers is planning to apply to change the water quality entering Snap Lake.	See Concordance Table in Application
What is the extra water? Did you say that there was no additional water?	De Beers will continue to see the volumes of water discharged by the mine increase. We are not applying to discharge more water; but the overall amount of salt (the loading) will increase because there is more water	Site Water Quality Report
Is the water better?	The water will have more salts in it, but De Beers has done studies to show that the water that goes into the lake will not have any effect on the aquatic environment.	Application and Supporting Information

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Question/Comments	DBC Response	How/Where Addressed
Comment: We are glad that you are doing monitoring not only in Snap Lake.	At the early days of monitoring, De Beers focused just on monitoring in Snap Lake. As De Beers continues to mine, the lake is not mixing the way it was thought. The water is mixing throughout the lake. When the requirements of the AEMP were revisited, De Beers applied to decrease the monitoring effort in Snap Lake, but move it to downstream lakes instead. For example, De Beers now have 14 monitoring stations at lac Capot Blanc. It can be seen that some of the Snap Lake effluent in LCB, so the monitoring is indeed working. De Beers is now evaluating the results of the monitoring to re-evaluate the location of future stations.	Water Licence AEMP Design Plan; AEMP Annual Report.
Do you test the water around Snap Lake? If so, where and how often?	De Beers monitors at different times of the year. January, April and summer. The most important time is April because when the ice freezes, the salts are excluded, so the water is more concentrated in these salts. The program doesn't just look at water; it also looks at organisms in the water.	AEMP Design Plan; Water Licence Surveillance Network Program
Comment: I will not comment on the application, but I do have a major issue with the public consultation associated with the application. I see a very obvious lack of participation especially in an	MVLWB: We can take it back, but can you also write a letter to let us know what the concerns are. Under MVRMA we encourage public consultation. As a part of this process we are looking at	No action from DBCI

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Question/Comments	DBC Response	How/Where Addressed
area like LKDFN. I have seen in the last six months that there has been a complete lack of participation and it should be addressed by the Board.	public participation because it is an issue for sure.	
Comment: It is completely a lack of participation in the public process.	MVLWB: There are ways to address the issues to fund for technical advisors etc.. to ensure participation. There is also an issue of language. You need to continue to look always to involve the communities.	No action from DBCI

Snap Lake Mine Planned Activities 2014

Erica Bonhomme, Environmental Manager
March 20, 2014

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Overview

- Overview of key projects under consideration for Q1-Q3 2014
 - Additional Fuel Storage
 - Contingency Surface Ore Stockpile
 - Design of West Cell of the North Pile
- Overview of documents to support Water Licence Amendment
- Planned Engagement for 2014

SNAP LAKE MINE

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



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Overview of Fuel Storage Tank Project

- Plan to add 20 ML additional fuel storage capacity
 - 10 million Liter tank to be constructed in 2014
 - a second 10 million liter tank to be installed in 2015
- Additional capacity required due to fuel demands of water management system
- Proposed to be located adjacent to existing Fuel Storage area
 - Approximately 70 m from Snap Lake
- Placed within 110% Containment as per Environment Canada Regulations

Location Options



Options

- Both areas are able to accommodate 2 tanks
- Option A preferred
 - Competent bedrock,
 - Can link to existing infrastructure
 - Simple cut-fill
 - Existing disturbed area
 - Within single lease
- Option B considerations
 - Located in a seasonally wet area,
 - Unsure of underlying material,
 - Would require stripping and fill
 - Requires building relocation
 - Requires lease boundary change

View of Option A Site



Current Plans- Fuel Storage

- Drilling to assess bedrock at Option A location (March 22)
- Evaluating secondary containment and foundation designs

Materials

- Tanks would be constructed on site: one in 2014; one in the future
- Steel plate and structures have been purchased and have been shipped to site on the Winter Road
- Explosives and liner materials have been purchased

Plan to submit application to amend land use permit within next month.

Contingency Surface Ore Stockpile

- Temporary storage of kimberlite ore prior to processing
- Contingency in the event that process infrastructure or mine infrastructure are shut down:
 - If underground crusher or conveyor belt are out of service, process plant continues to operate
 - If process plant is out of service, mining may continue
- Stockpile is for temporary ore storage: 1 -2 days or up to 2 weeks

Contingency Ore Stockpile

- Presently considering size, location and configuration of stockpile
- Potential location is across from process plant and water management pond



Contingency stockpile considerations

- Considerations include:
 - Size
 - Volume
 - Runoff water management
 - Dust control
 - Cost-benefit analysis
- Overall, would improve mine efficiency
- Feasibility being evaluated Q2 2014

North Pile: West Cell Development



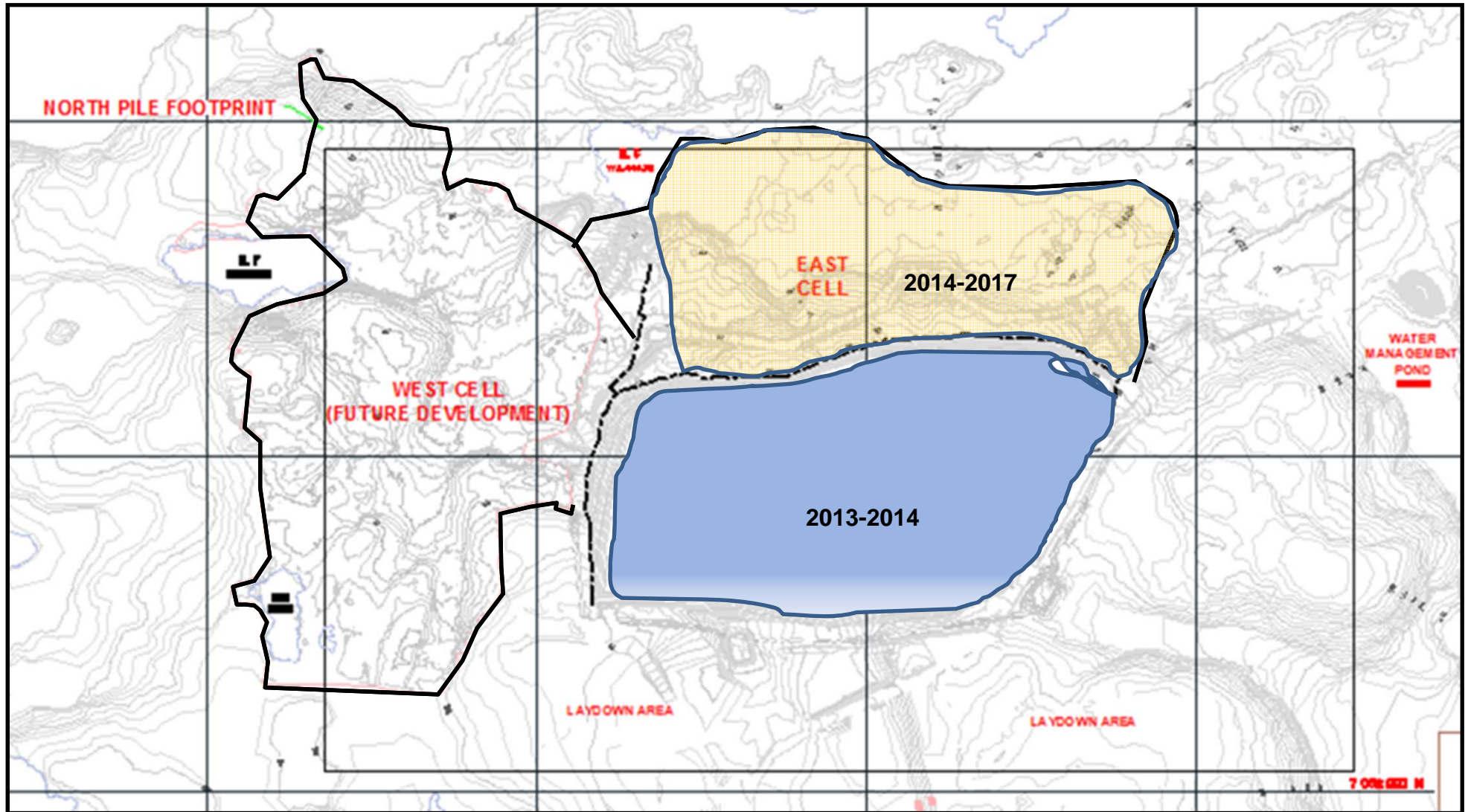
North Pile: Design Objectives

- Surface storage facility for processed Kimberlite and waste rock
- Accepts all material that potentially may be produced by mining activities
- Continuous operation during mining
- Will remain stable during construction, operation, closure and post closure of the project
- Designed like a coffee filter to allow water to flow out of the material and be collected and treated prior to discharge

North Pile: West Cell Development

- Starter Cell construction began in 2004. Deposition will be complete in 2014.
- East Cell construction began in 2012. Deposition will begin in 2014 and will continue to 2017.
- West Cell design is underway, with construction planned to begin 2015.
- Configuration is in accordance with Land Use Permit, Water Licence and Dam Safety Guidelines.
- Requires extension of water management system (sumps)

North Pile – Starter, East and Planned West Cell



West Cell Construction

- Long term plan for the North Pile is currently under review, including consideration of future size, height and configuration
- Snap Lake is assessing research completed to date on underground PK paste deposition
- Results of technical studies and deposition trials to be summarized as a supplement to the Water License Annual Report due March 31

Water Licence Amendment Application

- Submitted December 2013
- De Beers is applying to change the quality of water allowed to be discharged to Snap Lake
- Supported by water modeling studies and studies of the effects on aquatic life in Snap Lake
- Application is undergoing a coordinated review by the MVLWB and Review Board
- Technical sessions April 14-15(?)

Introduction to TDS and Limits at Snap Lake

- Total Dissolved Solids (TDS) is a measurement of the amount of ‘salts’ (including chloride and fluoride) in water.
- As mining proceeds, saltier water is released underground. The amount of “salt” is similar to that in mineral water
- Salts are naturally occurring; however, too much salt in water can be damaging to aquatic life.

Water License MV2011L2-0004 and TDS

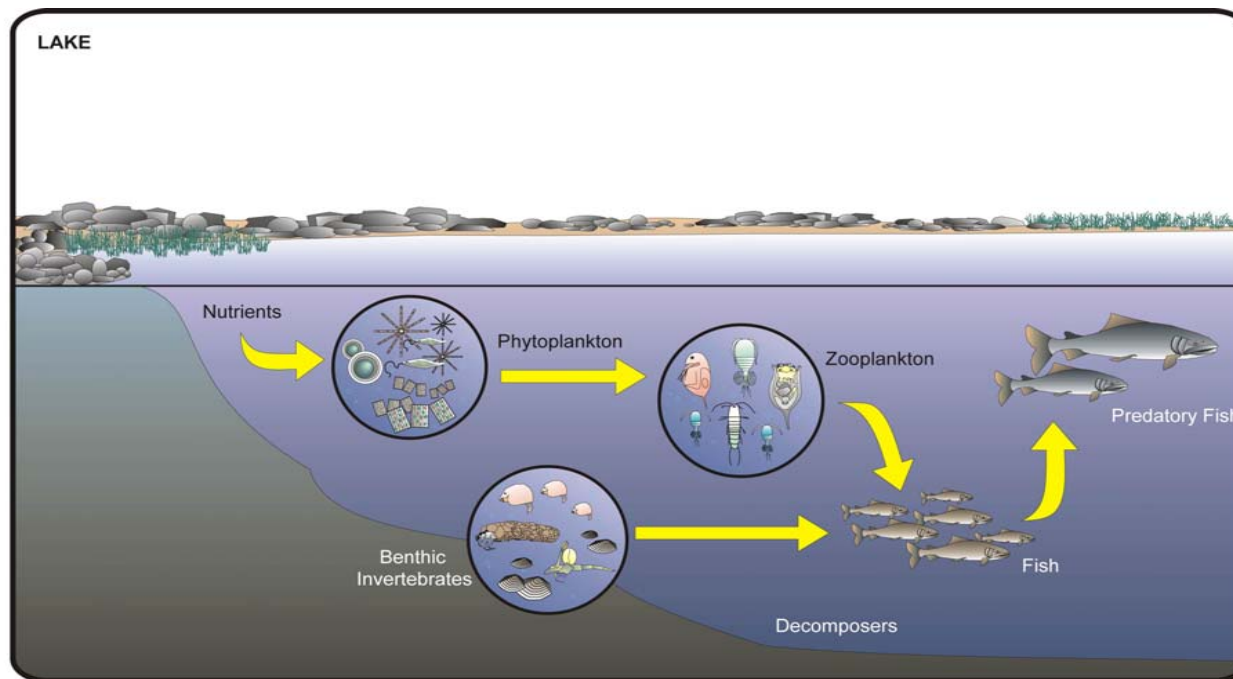
- Snap Lake's Water Treatment Plant treats for sediment (TSS) and adjusts pH of water – it does not treat for salts (TDS), ammonia or nitrates.
- TDS within Snap Lake increases as treated mine water is released into the lake.
- The current water licence specifies that the TDS limit Snap Lake is not to exceed 350 mg/L.
- This limit is not based on how much TDS aquatic life within Snap Lake can tolerate (a site-specific benchmark), since these studies were not complete at the time.
- Recent site-specific studies demonstrate that Snap Lake can handle a higher TDS load without effect on the environment.

Site-Specific Studies to Support Proposed Amendments

- Licence required submission of the following plans by December 31, 2013:
 - TDS Response Plan
 - Strontium Response Plan
 - Nitrogen Response Plan
- Notably, these plans were to include:
 - Identification of sources and quantification of loads in minewater
 - Current and potential water management practices to minimize loadings to the environment
 - Description of the effects of current and future loadings of TDS, chloride and fluoride on the environment
 - Recommendations for water quality objectives (WQO) for TDS, chloride, fluoride, strontium, nitrate and ammonia in Snap Lake
 - Recommendations of effluent quality criteria (EQCs) for the above parameters
 - Discussion of options for reducing the amount of TDS in effluent
- These three plans, and all of the associated studies have been included in the water licence application
- The studies undertaken for developing WQOs show that Snap Lake can tolerate higher loadings of TDS, chloride, fluoride, nitrite and sulphate than are currently allowed.

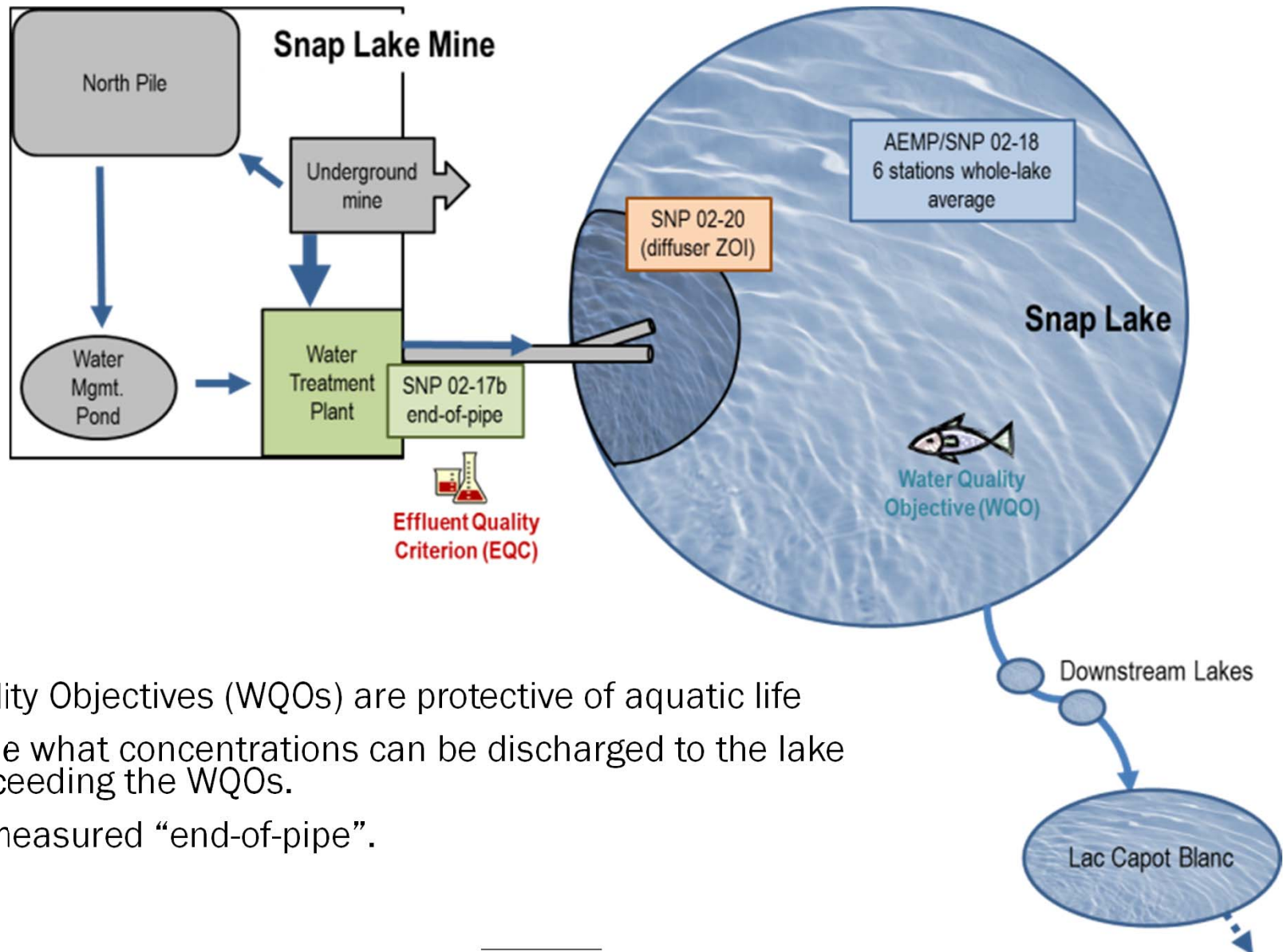
Site Specific Studies

- Developing WQOs required testing the response of aquatic organisms found in Snap Lake to progressively higher levels of each of the parameters of concern.
- Establish a chronic response threshold – the concentration at which reproduction is affected in 20% of the sample



- Results show that daphnia magna (water flea) is most sensitive to TDS, with response at 694 mg/L.

WQOs and EQCs: what is the difference?



- Water Quality Objectives (WQOs) are protective of aquatic life
- EQCs define what concentrations can be discharged to the lake without exceeding the WQOs.
- EQCs are measured “end-of-pipe”.

Proposed changes to the water licence EQCs

Parameter	Average Monthly Limit (mg/L)		Max Grab (mg/L)	
	current	proposed	current	proposed
Total Suspended Solids	7	7	14	14
Ammonia as N	10	10	20	20
Nitrite as N	0.5	1	1	3
Nitrate as N	22	14	44	32
Nitrate as N (January 1, 2015)	4	14	8	32
Chloride	310	378	620	607
Fluoride Jan1 2015	0.15	2.43	0.3	3.73
Sulphate	75	427	150	640
Metals	trace	remove	trace	remove
TDS	Propose removing current whole-lake average TDS Water Licence limit of 350 milligrams per litre (mg/L) and replacing with end-of-pipe AML of 684 mg/L and max grab of 1,003 mg/L.			

Review Process and Schedule (as issued by MVLWB-MVRB)

- Application filed December 19
- Comments due March 14; De Beers response due March 21
- Technical sessions April 14-15(?)
- Information requests April 16; response April 30
- Technical Reports (Parties) due May 21
- Public Hearing (Review Board) June 5-6
- Report of EA July 18, followed by Minister's Decision
- Water Licence Technical Review (September – November)
- Decision on Water Licence (December?)

2014 Planned Meetings and Engagement

- May-June 2014 Proposed Community Visits
 - N'dilo
 - Lutsel K'e
 - Behchoko
 - Yellowknife
 - Fort Resolution
 - Hay River
- July 7-18 Site Visits with each community
- September Annual Fish Tasting