



Mackenzie Valley Land and Water Board
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Staff Report

Applicant: De Beers Canada Inc. Snap Lake	
Location: Snap Lake, NT	Application: MV2011L2-0004
Date Prepared: November 9, 2015	Meeting Date: November 19, 2015
Subject: Request to change the Surveillance Network Program (SNP), annexed to the Water Licence (Licence) MV2011L2-0004.	

1. Purpose/Report Summary

The purpose of this report is to present to the Mackenzie Valley Land and Water Board (MVLWB/the Board) De Beers Canada Inc.'s (De Beers) September 24, 2015 request to change the Surveillance Network Program (SNP) requirement to monitor for total dissolved solids (TDS) at site 02-17b using in-line conductivity rather than in-house chloride, for Board decision.

2. Background

- September 24, 2015 – De Beers submitted the request;
- September 25, 2015 – Item distributed for review; and;
- November 19, 2015 – Presented to the Board for decision.

3. Discussion

On September 24 2015 De Beers requested to change the monitoring required at SNP 02-17b from “Daily, on-site, in-house chloride” to “Daily, on-site, in-line electrical conductivity”.

4. Comments

N/A

5. Reviewer Comments

Comments and recommendations on the request were submitted by the Government of the Northwest Territories (GNWT), Environment Canada (EC) and the Snap Lake Environmental Monitoring Agency (SLEMA) (attached). Both EC and SLEMA supported the requested changes. The GNWT agreed that conductivity has a better correlation with TDS than chloride; however, they recommended that ‘... the requirement for daily on-site in-house chloride measurements at SNP02-17b be replaced with “Daily, in-house estimates of maximum and average TDS”.

De Beers clarified in their response to the GNWT that they are seeking to “To replace the requirement for the parameter to be sampled (chloride) - not the

frequency or timing of such sampling. As such, ENR's recommendation to otherwise change the required frequency of sampling in an otherwise approved licence, should not be considered."

The GNWT is recommending that De Beers use the in-line conductivity to estimate actual maximum and minimum values of TDS because the TDS concentration is more easily interpreted and comparable to Licence compliance limits than a conductivity reading. In a follow up discussion with De Beers, they agreed to include the average daily conductivity readings and the equation as it relates to TDS at SNP 02-17b in the regular monthly SNP report. This will help reviewers interpret the conductivity readings.

The Reviewer Comment Summary Table and submitted letters are attached.

6. Security

N/A

7. Conclusion

There is agreement that in-house chloride measurements do not correspond well with actual laboratory measurement of TDS and that in-line conductivity provides a better correlation with actual TDS values.

GNWT recommended De Beers use the in-line conductivity measurements to calculate daily maximum and minimum TDS values for ease of interpretation. De Beers agreed to provide the average daily conductivity and the equation as it relates to TDS at SNP 02-17b in the monthly SNP report for ease of interpretation.

8. Recommendation

Board staff recommends the Board consider the following options:

Option 1: Agree with De Beers' request to change SNP 02-17b to 'daily, on-site, in-line electrical conductivity' provided that the daily conductivity reading and the correlation equation as it relates to TDS at SNP02-17b is also included.

Option 2: Agree with the GNWT recommendation to use the in-line conductivity reading to calculate daily maximum and minimum TDS values.

Option 3: Board make another determination that it deems appropriate.

9. Attachments

- [September 24, 2015 request](#) to change SNP Requirement for TDS correlation with in-line chloride to in-line conductivity;
- De Beers email to Board staff;
- Reviewer Comment Table;
- SLEMA letter of support;
- EC letter of support;
- GNWT comment and recommendations letter;
- Draft Decision Letter (Option 1);
- Draft Change to Licence and Annex A SNP (page 53 of the Licence); and

- Draft Reasons for Decision

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'MCASAS', with a long horizontal flourish extending to the right.

Marc Casas
Regulatory Officer

Review Comment Table

Board:	MVLWB
Review Item:	MV2011L2-0004 - Snap Lake - SNP - TDS correlation with inline parameters
File(s):	MV2011L2-0004
Proponent:	De Beers Canada Inc. - Snap Lake
Document(s):	Request letter regarding TDS correlation with inline parameters (1 MB)
Item For Review Distributed On:	Sep 25 at 11:03 Distribution List
Reviewer Comments Due By:	Oct 15, 2015
Proponent Responses Due By:	Oct 22, 2015
Item Description:	<p>De Beers where required to conduct a correlation study between TDS and in line Chloride. The request letter provides a summary of their findings and recommendations.</p> <p>Please review the document and provide your comments by October 15, 2015.</p> <p>Proponents responses are due October 21, 2015.</p>
Contact Information:	Jen Potten 867-766-7468 Marc Casas 867-766-7466

Comment Summary

Environment Canada: Loretta Ransom				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Response
1	General File	Comment (doc) EC comment letter Recommendation		
GNWT - Environment and Natural Resources: Central Email GNWT				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Response
2	General File	Comment (doc) ENR Letter with Comment and		

		Recommendation Recommendation		
1	Topic 1: Changing On-site In- house Chloride Measurement to Daily On- site In-line Electrical Conductivity	<p>Comment DeBeers has requested to replace the requirement for daily "on-site in-house chloride" measurement at SNP02-17b to "daily, on-site, in-line electrical conductivity". DeBeers' rationale for this request is that the data provided by the in-line and hand held chloride meters have not reliably correlated to data generated from water samples analyzed in a laboratory. Conversely, conductivity does appear to correlate relatively well to TDS calculated in laboratory analyzed water samples. Section 4.3.11 of the June 8, 2015 Reasons for Decision for Water Licence MV2011L2-0004 describes the inclusion of the on-site chloride measurements, and appears to suggest that the value of the on-site chloride data was that it could be used to estimate TDS. However, the information provided by DeBeers suggests that conductivity is the more appropriate analyte to use for the purposes of estimating TDS. Conductivity is currently monitored continuously at SNP02-17b using an in-line meter, and ENR is not certain that providing a single additional daily conductivity measurement at SNP02-17b will give reviewers the best additional information in</p>	<p>Oct 22: Water Licence (MV2011L2-0004) Annex A required De Beers to undertake and report on-site, in-house sampling of chloride at 02-17B on a daily basis. De Beers' request, as supported by the submission of September 24, 2015, is to replace the requirement for the parameter to be sampled (chloride) - not the frequency or timing of such sampling. As such, ENR's recommendation to otherwise change the required frequency of sampling in an otherwise approved licence, should not be considered.</p>	<p>In a follow up email De Beers did commit to 'provide the average daily conductivity and the equation as it relates to TDS at SNP 02-17b'. Appropriate response.</p>

		<p>terms of regulating the effluent. However, additional information on daily TDS concentrations would be useful for providing information on the variability of the TDS concentration in the effluent. The maximum TDS (based on the maximum recorded in-line conductivity) and the average TDS (using an average of the recorded in-line conductivities) should be provided.</p> <p>Recommendation 1) ENR recommends that the requirement for daily on-site in-house chloride measurements at SNP02-17b be replaced with daily in-house estimates of maximum and average TDS.</p>		
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Snap Lake Environmental Monitoring Agency - SLEMA: Zhong Liu

ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Response
1	General File	<p>Comment (doc) comments from SLEMA</p> <p>Recommendation</p>		



Snap Lake Environmental Monitoring Agency
Main Floor, Lahm Ridge Tower
4501 Franklin Avenue
P.O. Box 95, Yellowknife, NT X1A 2N1
Phone: 867-765-0961 FAX: 867-765-0963
Website: www.slema.ca

Marc Casas
Regulatory Officer
Mackenzie Valley Land and Water Board
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File: Water Licence MV2011L2-0004

October 9, 2015

Re: SNP – TDS Correlation with Inline Parameters

Dear Mr. Casas,

Snap Lake Environmental Monitoring Agency (SLEMA) has reviewed De Beers' Report on Correlation between On-Site and Laboratory Measurements of Chloride and TDS dated September 24, 2015, and would like to provide the following comments.

Based on De Beers' statistical analysis on on-site and laboratory measurements of Chloride and 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.
- 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"*.

If you have any questions whatsoever please feel free to contact the undersigned or Philippe di Pizzo at 867-765-0961 / exec@slema.ca.

Sincerely,

Original signed by

Philippe di Pizzo
Executive Director



Environment Canada Environnement
Canada Canada

Environmental Protection Operations Directorate (EPOD)
Prairie & Northern Region (PNR)
5019 52nd Street, 4th Floor
P.O. Box 2310
Yellowknife, NT X1A 2P7

October 15, 2015

EC File: 5100 000 034/004
MVLWB File: MV2011L2-0004

Marc Casas
Regulatory Officer
Mackenzie Valley Land and Water Board
7th Floor – 4910 50th Avenue
P.O. Box 2130
Yellowknife, NT X1A 2P6

Via online submission

RE: MV2011L2-0004 – De Beers Snap Lake – SNP – TDS Correlation with Inline Parameters

Attention: Marc Casas

Environment Canada (EC) has reviewed the information submitted to the Mackenzie Valley Land and Water Board (the Board) from De Beers (the Proponent) regarding Water Licence MV2011L2-0004 Part D, Section 3 requiring De Beers to report on the correlation between chloride (as measured on-site) and total dissolved solids (TDS) (as measured/calculated in a laboratory) in effluent from SNP (Surveillance Network Program) site 17b.

De Beers has concluded that on-site (in-line) chloride measurements are unreliable and in-line electrical conductivity provides much more reliable operational monitoring data. Consequently, De Beers has requested 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”. EC is supportive of De Beers’ requested change.

The Proponent is still required to comply with its obligations under relevant legislation, including the *Canadian Environmental Protection Act, 1999*, the pollution prevention provisions of the *Fisheries Act*, the *Migratory Birds Convention Act, 1994*, and the *Species at Risk Act*.

Should you require further information, please do not hesitate to contact me at (867) 669-4744 or loretta.ransom@ec.gc.ca.

Canada

www.ec.gc.ca

Sincerely,

A handwritten signature in black ink that reads "Loretta Ransom". The signature is written in a cursive style with a large initial "L".

Loretta Ransom
Senior Environmental Assessment Coordinator

cc: Sarah-Lacey McMillan, A/Head, Environmental Assessment North (NT and NU),
PNR-EPOD
EC Review Team

October 15, 2015

Jen Potten
Regulatory Officer
Mackenzie Valley Land and Water Board
7th Floor – 4910 50th Avenue
P.O. Box 2130
Yellowknife, NT
X1A 2P6

Dear Ms. Potten,

**Re: DeBeers Canada Inc.
Water Licence – MV2011L2-0004
SNP - TDS Correlation with Inline Parameters
Request for Comments**

The Department of Environment and Natural Resources has reviewed the document at reference based on its mandated responsibilities under the *Environmental Protection Act*, the *Forest Management Act*, the *Forest Protection Act*, *Waters Act* and the *Wildlife Act* and provides the following comments and recommendations for the consideration of the Board.

Topic 1: Changing On-site In-house Chloride Measurement to Daily On-site In-line Electrical Conductivity

Comment(s):

DeBeers has requested to replace the requirement for daily “on-site in-house chloride” measurement at SNP02-17b to “daily, on-site, in-line electrical conductivity”. DeBeers’ rationale for this request is that the data provided by the in-line and hand held chloride meters have not reliably correlated to data generated from water samples analyzed in a laboratory. Conversely, conductivity does appear to correlate relatively well to TDS calculated in laboratory analyzed water samples.

Section 4.3.11 of the June 8, 2015 Reasons for Decision for Water Licence MV2011L2-0004 describes the inclusion of the on-site chloride measurements, and appears to suggest that the value of the on-site chloride data was that it could be used to estimate TDS. However, the information provided by DeBeers suggests that

conductivity is the more appropriate analyte to use for the purposes of estimating TDS.

Conductivity is currently monitored continuously at SNP02-17b using an in-line meter, and ENR is not certain that providing a single additional daily conductivity measurement at SNP02-17b will give reviewers the best additional information in terms of regulating the effluent. However, additional information on daily TDS concentrations would be useful for providing information on the variability of the TDS concentration in the effluent. The maximum TDS (based on the maximum recorded in-line conductivity) and the average TDS (using an average of the recorded in-line conductivities) should be provided.

Recommendation(s):

- 1) ENR recommends that the requirement for daily “on-site in-house chloride” measurements at SNP02-17b be replaced with daily “in-house estimates of maximum and average TDS”.

Comments and recommendations were provided by ENR technical experts in the Water Resources Division and the North Slave Region and were coordinated and collated by the Environmental Assessment and Monitoring Section (EAM).

Should you have any questions or concerns please do not hesitate to contact Patrick Clancy, Environmental Regulatory Analyst, at (867) 920-6118 or email at patrick_clancy@gov.nt.ca.

Sincerely,



Patrick Clancy
Environmental Regulatory Analyst
Environmental Impact Assessment Section
Conservation, Assessment and Monitoring Division
Department of Environment and Natural Resources
Government of the Northwest Territories

From: [Whitaker, Sean](#)
To: [Marc Casas](#)
Cc: [Bonhomme, Erica](#); [Bradbury, Tom](#); [Hood, Alexandra](#)
Subject: Conductivity and Equation
Date: November-03-15 11:46:00 AM

Hi Marc,

As per our discussion, I spoke with Erica and it is possible to provide the average daily conductivity and the equation as it relates to TDS at SNP 02-17b in the monthly report for stakeholders if the board chooses to adopt the changes.

Please feel free to give me a call if you have any other questions

Regards,
Sean

Sean Whitaker B.Sc., C.Chem.
Regulatory Coordinator, Environment Snap Lake Mine

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