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Reasons for Decision

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| Preliminary Screener: | MVLWB |
| Reference/File Number: | MV2011L2-0004 |
| Applicant: | De Beers Canada Inc. |
| Project: | Snap Lake Diamond Mine, NT |

Decision from Mackenzie Valley Land and Water Board (the Board) Panel Meeting of

April 4, 2012

Reasons for Decision

Issued pursuant to section 26 of the *Northwest Territories Waters Act* (NWTWA)

Application

- The application was submitted to the Board pursuant to section 6 of the NWTWA, and the Board has accepted the application as complete.
- Notice was given in accordance with sections 63 and 64 of the *Mackenzie Valley Resource Management Act* (MVRMA) and section 23 of the NWTWA.
- There was a public hearing held in association with this application.

Background

The Snap Lake Diamond Project site is located on Snap Lake, NT (63 35'30 N, 110 52'00" W) and is owned and operated by De Beers Canada Incorporated (De Beers).

On June 8, 2011 the Mackenzie Valley Land and Water Board (MVLWB or the Board) received Water Licence (WL) application MV2011L2-0004 from De Beers. Since this is a renewal of current WL MV2001L2-0002, with no modification to the development, the application was deemed exempt from

preliminary screening by the Board on August 18, 2011. The application was reviewed, deemed complete and distributed for public review and comments on June 24, 2011. Reviewer comments were received on July 28, 2011, with De Beers providing responses on August 18, 2011. This information formed the basis for the technical session.

As part of the initial review process two (2) information requests (IR) were made of De Beers. IR#1, titled Water Quality Modeling of Total Dissolved Solid Concentrations in Snap Lake, was sent to De Beers on June 28, 2011. IR#1 requested that De Beers submit its plans for addressing predictions that TDS is predicted to exceed the Water Licence limits, yet De Beers did not request an increase to the WL limit for this Water Licence parameter¹. De Beers responded on June 29, 2011 stating that "Modeling completed by Golder Associates Ltd. (GAL) indicates that the 350mg/L operationally defined WL limit will be exceeded within 7-8 years. However, De Beers is not requesting a change to the current limit at the present time as we need to complete appropriate scientific studies before doing so"². IR#2 titled Application of the MVLWB *Water and Effluent Quality Management Policy* to Water License Application MV2011L2-0004 was sent to De Beers on August 5, 2011. IR#2 requested De Beers to explain how they are addressing the requirements of the Board's new *Water and Effluent Quality Management Policy*. As part of IR#2, a table was provided for De Beers to complete.³ De Beers responded to IR#2 on August 26, 2011.

A technical session was held from September 14 to 16, 2011 in Yellowknife. Following the technical session, the following reviewers submitted IRs: Aboriginal Affairs and Northern Development Canada (AANDC), Environment Canada (EC), and the Department of Fisheries and Oceans (DFO). The AANDC Inspector provided comments. De Beers provided responses to the IR's on October 13, 2011. The Board also retained EcoMetrix Incorporated as an independent reviewer to calculate possible water quality objectives (WQOs) and associated effluent quality criteria (EQC). EcoMetrix provided their review on October 19, 2011. The review was subsequently distributed to reviewers and the Proponent.

A public hearing took place on December 13 to 15, 2011 at the Explorer Hotel in Yellowknife, NT. The registered interveners were: AANDC, EC, DFO, Deninu Kue First Nation (DKFN), and the North Slave Metis Alliance (NSMA). The NSMA did not give a presentation at the hearing but did provide a written intervention. The following registered speakers gave presentations: Yellowknives Dene First Nation (YKDFN), Akaitcho Interim Measures Agreement (IMA) Office, Snap Lake Environmental Monitoring Agency

¹ Board Information Request#1, dated June 28, 2011

² De Beers response to Information Request #1, dated June 29, 2011

³ Board Information Request #2, dated June 28, 2011

(SLEMA), and Mr. Tim Byers. During the course of the public hearing, the following undertakings were made to the Board:

Undertaking 1: De Beers to provide a technical memorandum summarizing some of the literature and other information about chloride and the hardness relationship. This undertaking was completed and submitted on December 14, 2012, the second day of the public hearing.

Undertaking 2: AANDC to provide any other security information that is held under other regulatory instruments which include the Environmental Agreement, the land leases, or any other form that INAC may have. AANDC provided this information on December 22, 2011. De Beers responded to Undertaking 2 on January 5, 2012.

In addition to the undertakings, Board counsel requested De Beers submit evidence demonstrating De Beers' financial capacity to meet the financial obligations of any possible changes to the security estimate.⁴ All undertakings were satisfied and the Board closed the record.

The Board then reviewed the evidence on the record and prepared draft terms and conditions for the WL. This draft was distributed to reviewers and De Beers on February 6, 2012. The comment period deadline for reviewers was March 1, 2012. De Beers was given until March 12, 2012 to provide comments on the draft WL and to respond to reviewers comments.

Comments on the draft terms and conditions were received from AANDC, EC, DFO, Government of the Northwest Territories – Environment and Natural Resources Department (ENR), YKDFN, SLEMA, and De Beers.

The MVLWB met on April 4 and 5, 2012 to consider the draft terms and conditions of the WL and the comments submitted by reviewers and De Beers.

Decision

After reviewing the submission of the Applicant, the written comments received by the Board, and the Staff Report prepared for the Board and having due regard to all the facts and circumstances, the merits of the submissions made to it, and to the purpose, scope, and intent of the MVRMA and the NWTWA and Regulations made thereunder, the Board determined that MV2011L2-0004 be issued subject to the terms and conditions contained herein.

The Board's reasons for this decision are set out below. Details for each of the specific conditions are attached as Appendix A of these reasons. Appendices B and C also form part of these Reasons for Decision.

Requirement of Section 14 of the NWTWA

⁴Page 216, transcripts of Snap Lake Project Public Hearing, December 13, 2011

Existing Licensees

After reviewing the submissions filed on the Public Registry and made at the public hearing, the MVLWB is satisfied that, with respect to paragraph 14(4)(a) of the NWTWA, the granting of this Licence to De Beers would not adversely affect, in a significant way, any existing Licensee, providing the conditions of the Licence are met. There are no other Applicants with precedence.

Existing Water Users

Paragraph 14(4)(b) of the NWTWA prohibits the issuance of a licence unless the MVLWB is satisfied that appropriate compensation has been or will be paid by the Applicant to people who were, at the time when the Applicant filed its application with the Board, members of the classes of water users, depositors, owners, occupiers, or holders listed in subparagraphs 14(4)(b)(i) to (viii), who would be adversely affected by the use of waters or deposit of waste proposed by the Applicant.

The Board received no claims for compensation either during the prescribed period or afterwards. Provided that compliance with the Licence conditions is achieved, the Board does not believe that any users or persons listed in Paragraph 14(4)(b) of the NWTWA will be adversely affected by the use of Waters or the deposit of Waste proposed by the Licensee.

Water Quality Standards

Insofar as subparagraph 14(4)(c)(i) of the NWTWA is concerned, the MVLWB is of the view that compliance with the Licence conditions will ensure the waste produced by the operation of the Snap Lake Diamond Mine will be treated and disposed of in a manner which will maintain water quality consistent with applicable standards and the Board's *Water and Effluent Quality Management Policy*.

Effluent Quality Standards

Consistent with subparagraph 14(4)(c)(ii) of the NWTWA, the Board is satisfied that the effluent standards it has set out in the WL as conditions are consistent with the Board's *Water and Effluent Quality Management Policy* and will protect the receiving waters and environment. These are further discussed below in Part F: Conditions Applying to Water Management.

Financial Responsibility of the Applicant

The MVLWB must satisfy itself of the financial responsibility of De Beers under paragraph 14(4)(d) of the NWTWA before it can issue the Licence. The project will be undertaken by De Beers Canada which is a wholly owned subsidiary of De Beers Societe Anonym (DBsa). On November 4, 2011 Anglo American PLC

and the Oppenheimer Family (CHL Holdings Limited) announced their agreement for Anglo American to acquire the Oppenheimer family's 40 percent interest in DBsa. Upon completion of the transaction, Anglo American will become the majority shareholder in DBsa, and thus De Beers will become a member of the Anglo American Group. This transaction remains subject to regulatory and governmental approvals and is expected to close in the second half of 2012.

The annual audited financial statements of Anglo American PLC were submitted during the public hearing on December 15, 2011. This evidence confirms that the parent company of De Beers is a large mining operator and that it has ample financial resources which would be available if De Beers were unable to complete closure and reclamation of the Snap Lake project on its own. Moreover, the financial security already posted with the Minister of AANDC in relation to this project is considerable and available under the terms of the NWTWA to address any problems at the mine site, including a failure to complete closure and reclamation activities. De Beers has a good compliance record and the MVLWB is confident that De Beers is capable of meeting any financial obligations set out in the NWTWA and the Licence concerning any closure and reclamation or decommissioning work required.

Requirements of Subsection 15(2) of the NWTWA

The Board is convinced that adherence to the terms and conditions it has imposed on the Applicant in the Licence will ensure that any potential adverse effects on other water users which might arise as a result of the issuance of the Licence will be minimized.

Requirements of Subsection 17 of the NWTWA

Pursuant to subsection 17(1) of the NWTWA, the Board may require the Licensee to provide security to the Minister in accordance with the Northwest Territories Water Regulations (the Regulations). Subsection 17(2) of the NWTWA specifies how much security may be applied, including the compensation of persons affected by licensed activities and the reimbursement of the Government of Canada for expenditures made during the course of remedial activities necessary under subsections 37(3) and 39(1) of the NWTWA.

Water Licence MV2011L2-0004 Terms and Conditions

The conditions set forth in the WL have been imposed in order to address the Board's statutory responsibilities and those concerns which arose during the regulatory process. This section of the Reasons for Decision will only discuss those matters that, in the view of the MVLWB, may have a material effect on the contents of the Licence. Appendix A (Terms and Conditions Summary Table), attached to these Reasons for Decision, provides rationales for all terms and

conditions included in the Licence. Rationale for effluent quality criteria (EQC) determinations are provided in Appendix C.

In drafting the licence, changes were made based on the following overriding principles; consistency with existing type A water licences; addressing comments from reviewers and Proponent; and overall clarity of licence requirements.

In order to address the issue of clarity, the overall structure of the WL has been changed and a table of contents has been included. All management plans, reports, and the security deposit referenced in the main body of the Licence have been moved into the Schedules appended to the Licence. The purpose of this is to allow the reader to easily locate provisions relating to specific plans and reports. In addition, this will facilitate the implementation of any changes that may be required to items in the Schedules.

In response to reviewers' requests that the WL provide clarity about when plans and reports are to be updated, all plans contained in the licence include a list of triggers specifying when each particular plan or report is to be reviewed and/or updated.

Water Licence Term

The term of the licence was one of the main points of discussion in this proceeding. Originally De Beers requested a 15 (fifteen) year term. Since this term would set the next licence renewal well past the time when total dissolved solids (TDS) limits are predicted to be exceeded, reviewers recommended that the term should be between five (5) and eight (8) years. During the public hearing, De Beers withdrew their initial request and suggested an eight (8) year term be applied. Reviewers suggested the following term lengths be applied;

- **AANDC's** intervention stated that "AANDC recommends that the term of the licence be five (5) to seven (7) years. AANDC considers that five (5) years (2017) may be more appropriate since worst case total dissolved solids (TDS) predictions suggest that the TDS concentration identified in the EA may be exceeded in 2018."⁵ However in the public hearing they stated that a term of five (5) to eight (8) years would be acceptable.
- **AANDC-Inspector** suggests a term of five (5) years.
- **DFO's** intervention recommended a term be no longer than five (5) to seven (7) years. DFO suggested that a five (5) year term would ensure that a renewal occurs before De Beers has predicted that the TDS limit of 350 mg/L will be exceeded.⁶

⁵ AANDC's Intervention, November 7, 2011

⁶ DFO's Intervention, November 7, 2011

- **EC's** intervention suggested a term of no longer than six (6) to eight (8) years.⁷
- **DKFN's** intervention suggested a shorter term due to increases in TDS values. Specifically, DKFN suggested a term of five (5) years is preferred. "This will ensure that unexpected exceedances of water quality guidelines are addressed in a timely manner. It will also allow for adaptive management to occur where uncertainties exist in the enacted mitigation measures."⁸
- **SLEMA's** comments on the WL renewal (October 18, 2011) recommends a five- (5) to six- (6) year term. SLEMA cites the following rationale; the Fluoride levels will remain higher than CCME guidelines until 2016 and the Chloride levels will be above BC guidelines in 2016. TDS levels will exceed the current WL limit in 2018. In SLEMA's opinion, these predictions make it inappropriate to grant De Beers a new WL with the term of longer than six (6) years. SLEMA also believes that compliance performance of De Beers, with regards to the current WL presented by the Inspector on September 16, 2011, revealed that De Beers needs to improve the environmental management, operation, and reporting. In SLEMA's opinion, this also warrants a shorter term for the new WL.
- **NSMA's** intervention states that they support a term of five (5) to six (6) years, for the same reasons provided by SLEMA. In addition, they would prefer that the WL and the Land Use Permit be renewed at the same time.

The Board has set the term of the Licence to be eight (8) years. The term of the Licence is not an enforcement issue. If the water quality in Snap Lake approaches the TDS or other WQOs, the Licence can be amended at the appropriate time; it does not require a renewal. Changes have been made to the WL to allow for more active management of the WL through implementation of the various Response Plans. In addition, the considerable time and resources involved in a type A WL renewal by all parties involved was also a factor considered in determining the term of the WL.

Part A: Scope and Definitions

In an effort to be consistent with other type A WLs four (4) conditions were added to the scope. Conditions b) and e) were moved in from Part B of the original licence (MV2001L2-0002) to be consistent with other type A WLs. The proposed addition of conditions c) and d) are also meant to maintain consistency with other type A WLs.

⁷ EC's Intervention, November 9, 2011

⁸ DKFN's Intervention, November 9, 2011

Definitions

The definitions section, for the most part, contains standard wording similar to that found in previous WLs issued by the MVLWB. Where appropriate, new definitions were added. Some additional changes to definitions were made in order to be consistent with other type A WLs. Definitions from MV2001L2-0002 of words not used in the renewal WL were deleted. A summary of changes to the definitions can be found in the Reasons for Decision's Comment Table, Appendix A

Part B: General Conditions and Schedule 1

The General Conditions section stipulates matters regarding compliance and conformity with the MVRMA and the NWTWA. There are also conditions in this section which pertain to the Surveillance Network Program (SNP), measuring devices, signage, and the location of copies of this WL. These are standard conditions found in previous WLs issued by the Board.

The changes made to this section are due to: recommendations received; a desire for improved consistency with other type A water licences; and improved clarity. The main changes to this section include moving the specific requirements for the Annual Report into Schedule 1 and deletion of the requirement (previously Part B, Item 12) for a standalone Adaptive Management Plan (AdMP). This latter change to the WL is discussed further below.

Adaptive Management

In its Report of Environmental Assessment (EA) on the Snap Lake Diamond Mine (July 2003), the Mackenzie Valley Environmental Impact Review Board (MVEIRB) recommended that the project's Water Licence contain a requirement for an Adaptive Management Plan (AdMP). According to the MVEIRB, the AdMP was to address uncertainties in the way the effluent would mix in the lake (Recommendations 8 and 9) as well as in the geotechnical performance of the North Pile (Suggestion 3). Accordingly, Part B, Item 12 of Water Licence MV2001L2-0002 required an AdMP that addressed the uncertainties listed above as well as requiring the details of various mitigation measures and to be linked to the Aquatic Effects Monitoring Program (AEMP). De Beers originally submitted an AdMP in August 2004 and an updated version in April 2011.

Review comments on the updated 2011 AdMP submitted by De Beers suggested that the plan lacked the detail necessary to be effective. Reviewers made several suggestions for improvement including incorporation of the concepts and principles described in the Board's draft *Guidelines for Adaptive Management – A Response Framework for Aquatic Effects Monitoring*⁹. De

⁹ Wek'èzhìì Land and Water Board, October 17, 2010

Beers, both in its response to reviewer comments¹⁰ and in the updated AdMP itself, agreed with the suggestion to use the draft guidelines as a basis for further updates. The Board did not request further revisions; however, it noted that WL conditions relating to the AdMP would be further assessed and improved during the WL renewal process¹¹.

In its renewal application, De Beers requested the removal of the requirements for a standalone AdMP. The rationale given by De Beers was essentially that the requirements of Part B, Item 12, a) to e) were redundant to other licence conditions. In their interventions, AANDC, EC, and DFO recommended that adaptive management requirements related to aquatic effects be placed directly into the Aquatic Effects Monitoring Plan (AEMP). AANDC further recommended¹² that the concepts of adaptive management, as described in the draft guidelines, be incorporated directly into other management and monitoring plan requirements in the Licence.

Consistent with review comments on the 2011 AdMP update, AANDC¹², EC¹³ and DFO¹⁴ recommended that adaptive management requirements in the renewed Licence be based upon concepts and principles described in the Board's draft guidelines. The guidelines, which have been publicly reviewed, were written by the Wek'èezhii Land and Water Board based on experiences with implementing adaptive management at other NWT diamond mining projects. The Response Framework requires Proponents to take appropriate action upon reaching pre-defined levels of environmental change or effect (the "action levels") as measured through ongoing monitoring. If any of the tiered action levels are exceeded, the Proponent is required to submit a Response Plan that details actions to be taken and may include, for example, further investigations, changes to operations, or enhanced mitigations. The guidelines therefore describe a systematic and transparent method for responding to the results of monitoring.

The Response Framework was initially developed specifically for aquatic effects monitoring, but, as pointed out by AANDC in its intervention, the principles can be applied to any plan that contains a monitoring component. De Beers also expressed¹⁵ interest in utilizing the guidelines as a basis for further adaptive management planning at Snap Lake. Therefore, the Board has incorporated elements of the Response Framework into the WL as described further below.

¹⁰ Responses to review comments on the AMP were submitted by De Beers on July 25, 2011

¹¹ Letter from the MVLWB to De Beers dated August 18, 2011, re Adaptive Management Plan Acceptance

¹² Section 5.2 of AANDC's Technical Intervention, November 7, 2011

¹³ Section 3.2, pages 8-9, of EC's Intervention, November 9, 2011

¹⁴ Section 2, pages 6-7, of DFO's Intervention, November 7, 2011

¹⁵ Page 13 of De Beers' Adaptive Management Plan (May 2011) and pages 17-18 of De Beers' Response to Interventions, November 21, 2011

De Beers has stated that it is in favor of incorporating adaptive management measures in the renewal Water Licence and has left it to the Board to decide whether there should be a standalone plan or whether such measures “Should be incorporated into other plans and measures required by the Water Licence”¹⁶. AANDC suggested that adaptive management be incorporated into various plans within the licence but that this did not “negate the need for a standalone plan”; however, no specific rationale was given for the need for both requirements in AANDC’s intervention.

In making its decision, the Board also considered the comments from DKFN¹⁷ and the YKDFN¹⁸ that indicated that adaptive management at the Snap Lake site has not been satisfactory to date, implying that the standalone AdMP requirement was not achieving the results desired by the MVEIRB and the Board. Therefore, the Board has decided not to require a standalone AdMP in the renewed Licence. Adaptive management requirements, including relevant Recommendations and Suggestions from the 2003 Report of EA, have been incorporated directly into the North Pile Management Plan, the Water Management Plan and the Aquatic Effects Monitoring Plan as discussed in more detail in specific sections below and in Appendix B.

In its comments on the draft WL, AANDC expressed a concern that MVEIRB’s Recommendations and Suggestions regarding adaptive management may not have been adequately satisfied given the replacement of a standalone AdMP with the elements of the Response Framework. The Board does not share this concern, and Appendix B specifies which WL conditions directly address the relevant EA measures. Overall, the Board is confident that the licence contains terms and conditions that implement the MVEIRB measures, will ensure that the project can be adaptively managed, and that project-related effects on the environment will remain within an acceptable range.

Part C: Conditions Applying to Security Requirements

The changes made to this section of the WL improve consistency with other type A Water Licences and provide greater clarity for De Beers. All items referring to amounts of security to be posted based on the current stage of mine life have been moved to Schedule 2. This will facilitate the implementation of any future adjustments to the security amounts.

AANDC and De Beers were not able to agree on the final security amount necessary to address the cost of closure. De Beers submitted in its response to interventions and during the public hearing that the Board should adopt De

¹⁶ Paragraph 58, page 18 of De Beers’ Response to Interventions, November 21, 2011

¹⁷ Pages 57-66, transcript of Snap Lake Project Public Hearing, December 15, 2011

¹⁸ Pages 147 (lines 21-25) and 148 (lines 1-12), transcript of Snap Lake Project Public Hearing, December 15, 2011

Beer' security estimate of \$49,932,130 over that of AANDC's. However, at this time, De Beers is not requesting that the MVLWB decrease the total land and water related security amount for the Snap Lake Mine, which is currently at \$60,101,922. AANDC's security estimate was \$75,373,336. The majority of the discrepancy in cost was due to differences in calculating Mobilization/demobilization which equated to a \$8,644,743 difference, and post-closure monitoring and maintenance which accounted for a \$12,527,280 difference.¹⁹

During the public hearing, AANDC was requested to submit a breakdown of all security held under all instruments. Undertaking 2 was submitted by AANDC on December 22, 2011, confirming that AANDC, on behalf of the Minister, holds a total of \$76,796,701. in security for the Snap Lake Diamond Project. Below is the security currently posted under each instrument:

- Type A Land Use Permit \$19, 878,845.00
- Type A Water Licence \$36,917,856.00
- Environmental Agreement – Additional Security Deposit (ASD) \$20,000,000.00

AANDC maintains that \$56,796,701.00 is currently held by the Minister for the purpose of closure and reclamation of the Snap Lake Mine. In AANDC's opinion, the \$20,000,000.00 held under the Environmental Agreement as an ASD is not available to be used for closure and reclamation costs. In response to Undertaking 2, De Beers' counsel submitted a letter setting out their interpretation of the Environmental Agreement in regards to the ASD. De Beers feels that the \$20,000,000.00 held as ASD is available for closure and reclamation activities, citing Article 12.1 (a) of the Environmental Agreement.

The Board decided to maintain the security estimate at \$39,066,247.00. The Board notes that the current renewal process only allows for changes to Water related securities. The security held under the Land Use Permit cannot be changed until 2016. AANDC's intervention recommended the water related liability be set at \$33,240,546.00 for Water and \$42,132,790 for Land. Therefore, the current value of \$39,066,247.00 is adequate to address the water-related liability. The land portion of the security can be addressed at the appropriate time. In addition the Board understands that following the Water Licence renewal, a review process for the Interim Closure and Reclamation Plan (ICRP) will be initiated, resulting in an updated ICRP. Any changes to the security estimate resulting from the updated ICRP may result in an adjustment of security as per Part C Item 4 of the WL.

¹⁹Page 23 of De Beers Response to Interventions, November 21, 2011

Part D and Schedule 3: Conditions Applying to Construction

The changes made to this section have been made to improve consistency with other type A Water Licences and to provide greater clarity. Items referring to the Detailed Design Report (namely Items 1 and 4 of the MV2001L2-0002) were moved to Schedule 3. Minimal changes were made to the wording. For changes to specific conditions, please refer to Appendix A.

Part E and Schedule 4: Conditions Applying to Waste Management

In March 2011, the Board approved *Guidelines for Developing a Waste Management Plan* (the Guidelines) and requires all water licence Applicants to submit a draft Waste Management Plan with their application. The Guidelines do not specify the same requirement for renewal applications; however, the Board has, in this case, added a requirement for a Waste Management Plan to De Beers' renewed Licence in Part E, Item 1. One of the considerations in this decision was to reduce the number of plans in the WL that have similar or overlapping content. The Waste Management Plan (WMP) will generally describe how all different types of waste are handled at the site as well as De Beers' overall strategy for waste management. To avoid duplication, the WMP will only give details for those waste streams not already described in detail in other major plans including the North Pile Management Plan. The Domestic Waste and Sewage Plan as well as the Hazardous Waste Management Plan, as approved under MV2001L2-0002, are to be incorporated into the WMP and, therefore, separate requirements for these plans have been removed.

Part E, Item 6, describes objectives for the construction, operation and maintenance of the North Pile Facility. This provision is new to the renewal Licence but is consistent with the principles of goal-based regulation and is meant to clarify the Board's expectations for the ongoing management and monitoring of the North Pile. As stated in Part E, Item 8, the North Pile Management Plan must describe how the Licensee is meeting the stated objectives in addition to providing the details required in Schedule 4, Item 2. Plan requirements are listed in Schedule 4, Item 2 grouped by the basic components of adaptive management: operation/management, monitoring, and responses to monitoring results (i.e., a Response Framework). Monitoring results and responses to action level exceedances are to be reported in the Annual Water Licence Report. The Board notes that the North Pile Management Plan (approved in February 2010) already contains much of the information required in Schedule 4; therefore, there is no requirement to update the Plan immediately although an update may be necessary depending on the outcomes of the North Pile Risk Assessment as discussed below.

During the renewal process, many parties raised concerns about the performance of the North Pile. SLEMA has raised concerns²⁰ about the

²⁰ Letter from SLEMA to MVLWB, dated October 18, 2011 re Water Licence Renewal

potential for “seepage with high levels of ammonia, nitrate and other contaminants” spilling from the East Cell of the North Pile into Snap Lake. SLEMA based their concerns on, among other issues, the number of spills that have occurred in the Starter Cell over the past several years, they recommended an increased monitoring effort as well as a risk assessment. In its intervention, AANDC argued that the North Pile is not being operated as designed with respect to the composition of the tailings (i.e., slurry versus paste tailings) that have been deposited in the Starter Cell to date. AANDC stated that:

As a consequence of this change to the North Pile operation, there are problems anticipated with the stability, water management and closure of at least the starter cell and possibly the entire North Pile, depending upon when/if paste discharge is conducted.²¹

AANDC provided a series of recommendations for more effective monitoring, water management and further investigation of potential closure issues. De Beers’ own consultant engineer from Golder Associates, Paul Bedell, has also raised a number of issues²² with water management, monitoring, and ongoing development of the North Pile although, at the public hearing, Mr. Bedell maintained that the North Pile is performing as per the design²³, and he had no concerns relating to the stability of the North Pile. De Beers acknowledged that “a risk assessment of the North Pile, which includes an evaluation of preventative and reactive controls that apply to the North Pile, would be of value and would assist in resolving the concerns expressed by Interveners”²⁴; De Beers has proposed to complete this in 2012. A requirement for a risk assessment of the North Pile has been added to the Licence in Part E, Item 10. In addition to the Risk Assessment itself, Part E, Item 10 requires that De Beers also submit recommendations for changes to the management of the North Pile facility and a schedule of implementation. If approved, these changes would be documented in an updated North Pile Management Plan.

Part F and Schedule 5: Conditions Applying to Water and Wastewater Management

Consistent with clarifications made with respect to conditions for the North Pile, the Licence now states, in Part F, Item 4, the objectives for managing the water and wastewater on site. The requirements for the Water Management Plan have been revised to incorporate the elements of adaptive management as similarly described above for the North Pile Management Plan.

²¹ Section 4.1 of AANDC’s Intervention, November 7, 2011,

²² Field Report for September 2011 Geotechnical Inspection of the North Pile and Water Management Ponds, Snap Lake Mine, November 21, 2011

²³ Page 67, lines 3-12, transcript for Snap Lake Project Public Hearing, December 13, 2011

²⁴ Paragraph 52, pages 15-16 of De Beers’ Response to Interventions, November 21, 2011

The Board has removed the condition for the Groundwater Quantity and Quality Monitoring (GQQM) Program (previously Part F, Items 5 and 6 of MV2001L2-0002) as it was deemed redundant. For example, management and monitoring of groundwater that seeps into the underground mine is already described in the Water Management Plan. The GQQM program was also meant to describe any anticipated mitigation measures related to groundwater but this information is now to be reviewed in the TDS Response Plan (see below) and implemented through the Water Management Plan.

The requirement for a Sampling Plan for TDS, calcium and chloride (previously Part F, Item 12 of MV2001L2-0002) has also been removed as the requirements are already being met in the AEMP, the SNP, and the Water Management Plan.

Effluent Quality Criteria

In its renewal application, De Beers did not recommend changes to any of the EQC in Water Licence MV2001L2-0002. However, to ensure consistency with the Board's *Water and Effluent Quality Management Policy*²⁵ (the Policy), the Board hired²⁶ an independent third-party consultant, EcoMetrix Inc., to review and recommend effluent quality criteria (EQC) for the Snap Lake Diamond Mine.

During the Technical Sessions held on September 14-16, 2011, the Board solicited input on which parameters should be considered by EcoMetrix in its review of EQC for this Water Licence. Parties recommended parameters that fell into three categories: 1) parameters that already have an EQC²⁷; 2) parameters that have or may, in future, exceed water quality guidelines in the receiving environment as shown through monitoring data (i.e., fluoride, manganese and chloride); and 3) other parameters that show, through monitoring data, an increasing trend in the receiving environment (i.e., barium, boron, and strontium).

EcoMetrix submitted its report containing EQC recommendations on October 19, 2011. The EcoMetrix report was placed on the Public Registry so that it was available for parties to use and comment on in their interventions to the public hearing. A representative of EcoMetrix, Dr. Don Hart, was also present at the hearing to answer questions on the report and recommendations.

The Policy defines two objectives for regulating the deposit of waste through water licence conditions. The first objective is to maintain water quality in the receiving environment "at a level that allows for current and future water uses". The second objective is to minimize the amount of waste to be deposited to the receiving environment according to the principles of pollution prevention. Both of

²⁵ The Policy was effective as of March 31, 2011

²⁶ See request to EcoMetrix Inc. from the MVLWB dated September 20, 2011

²⁷ In MV2001L2-0002, the following parameters have EQC: total suspended sediments, ammonia, nitrite, nitrate, aluminum, arsenic, cadmium, chromium, copper, nickel, lead, zinc and pH.

these objectives are considered in the Board's determination of EQC and other Water Licence conditions for the Snap Lake Diamond Mine as discussed further below.

Water Quality Objectives

According to the Policy, EQC for a project "Must be set at levels that will ensure water quality standards for the receiving environment will be met." Water quality standards must therefore be defined first that will meet the objective of protecting current and future water uses for a given water body. The Board notes that the EA for the Snap Lake Diamond Project evaluated water quality changes against standards for the protection of aquatic life and for drinking water; therefore, water quality standards for Snap Lake must, at a minimum, protect these water uses.

In its submission to the Board, EcoMetrix took the following approach to setting water quality standards, also called water quality objectives (WQOs), for Snap Lake. If available, EcoMetrix generally adopted WQOs from the CCME's *Canadian Water Quality Guidelines for the Protection of Aquatic Life*. For parameters that did not have guideline values, EcoMetrix took the approach of choosing the lowest chronic values from the toxicity literature or guidelines from other jurisdictions. In its intervention, AANDC generally supported EcoMetrix's approach to setting WQOs, although in some cases they proposed lower WQOs for some parameters based on guideline values from the British Columbia Ministry of Environment (BCMOE). As documented in Appendix C, when a guideline value was used in setting an EQC, the Board decided to use the CCME values in preference to the BCMOE values on the basis that the former represents national standards.

In paragraph 12 of its response to interventions, De Beers states that the approach of using generic guideline values as WQOs for Snap Lake is "Not site-specific and, in general, are unnecessarily conservative for what is required in Snap Lake with no additional environmental benefits. De Beers submits that this approach is overly simplistic, unrealistic and is not consistent with the Policy". De Beers, however, has misinterpreted the Board's intent with regard to site-specific WQOs in the Policy.

The Policy states that WQOs will be based on information developed on a "site-specific basis"²⁸ as an acknowledgment that WQOs have not been set for all water bodies in the NWT. The Policy goes on to describe the kinds of information upon which site-specific WQOs will be set; this information clearly includes published water quality guidelines. AANDC has also stated that although it would be ideal if "enough information were gathered to warrant and derive site-specific parameters and criteria for each water body", the adoption of

²⁸ Section 7.2 of the *Water and Effluent Quality Management Policy*, MVLWB, March 31, 2011

water quality guidelines as WQOs is an appropriate and precautionary approach at this time.²⁹

The Board agrees with AANDC and believes that the Policy envisioned the adoption of generic water quality guidelines as WQOs, as appropriate, for a specific receiving environment. The Board notes that De Beers has already initiated studies to collect more site-specific information for water quality objectives for nitrate, strontium, and total dissolved solids (TDS) and when this information is available, the Board will consider it. In the meantime, the Board has based its decisions about WQOs on the evidence before it at this time. Details of evidence and Board decisions related to parameter-specific WQOs and EQCs are discussed in Appendix C.

Mixing Zone

EcoMetrix calculated EQC for all parameters requested with the assumption that WQOs should be met at the outlet to Snap Lake. This would essentially mean treating all of Snap Lake as the “mixing zone” which, according to the Policy, means the “area between the point of effluent discharge and the point at which water quality standards need to be met”. Both AANDC and EC pointed out that in Water Licence MV2001L2-0002, the mixing zone is defined as the area contained within a “radius of 120 degrees at 200 metres from the diffuser”³⁰, and recommended that WQOs should, therefore, be met at the edge of this mixing zone instead of at the outlet of Snap Lake.

The choice of a mixing zone normally affects the final EQC calculated. However, at the public hearing, EcoMetrix stated that because there is a lack of a spatial gradient of contaminants across Snap Lake, the EQC calculated will not be much different at whichever point in Snap Lake the WQOs are applied.³¹ AANDC agreed with this analysis,³² and monitoring data from the 2010 AEMP Annual Report support the lack of a gradient across Snap Lake.³³ De Beers stated³⁴ that the EQC proposed by EcoMetrix are lower than if a mixing zone had been considered because of the mixing provided by the effluent diffuser; however, no specific evidence was provided on this point. In fact, no party

²⁹ Pages 219-220, transcript of DBCI of Snap Lake Project Water Licence Renewal Public Hearing, December 14, 2011

³⁰ Page 2 of the Surveillance Network Program of MV2001L2-0002, part of the definition of SNP station 02-20

³¹ Page 104 lines 21-25 and page 105 lines 1-10, transcript of Snap Lake Project Public Hearing, December 14, 2011

³² Page 30, lines 2-25 and page 31 lines 1-13, transcript DBCI of Snap Lake Project Water Licence Renewal Public Hearing, December 15, 2011

³³ See Appendix IV of the 2010 Snap Lake AEMP Annual Report, several parameters show little or no difference in concentration between the edge of the mixing zone and the far-field of Snap Lake, confirming the lack of a strong spatial gradient for most parameters.

³⁴ Page 195, lines 3-10, transcript of DBCI of Snap Lake Project Water Licence Renewal Public Hearing, December 13, 2011

provided EQC that were specifically calculated to meet WQOs at the edge of a 200 m mixing zone. Nonetheless, the Board prefers to maintain the mixing zone set in the original Water Licence and has, in some cases, adopted the EQC developed by EcoMetrix with the assumption that WQOs will be met at the edge of the 200 m mixing zone. Considerations of the mixing zone in setting individual EQC are discussed in more detail in Appendix C. Ongoing monitoring at the edge of the mixing zone will test these assumptions and EQC can be adjusted in future if necessary.

Calculation of EQC

EcoMetrix developed a mass and water balance model of Snap Lake in order to calculate EQC that, if achieved by 2014 and maintained through to the end of 2022, would allow the selected WQOs to continue to be met in Snap Lake. Five³⁵ of the twenty EQC's calculated by EcoMetrix are lower than what is currently achievable in the discharge from the water treatment plant. In EcoMetrix's opinion³⁶, these five parameters (i.e., ammonia, nitrate, chloride, total dissolved solids, and strontium) are likely to exceed WQOs in Snap Lake without improved treatment. An evaluation of each recommended EQC is provided in Appendix C, but a general discussion of the validity of the EcoMetrix model and calculations is provided below.

In its response to interventions, De Beers listed³⁷ several potential problems with the model EcoMetrix developed to calculate EQC for Snap Lake. The problems had to do with concerns that EcoMetrix had not included, in the model, such considerations as recirculation of lake water through the mine or time-varying flows to the mine. However, in his presentation, Dr. Hart refuted De Beers' concerns and went on to state that:

Our model certainly isn't as complex as the 3D hydrodynamic model used by Golder³⁸. However, the method is valid for conservative substances³⁹ as evidenced by the fact that our calibration run for total dissolved solids, a conservative substance, gives TDS predictions for Snap Lake that are in good agreement with the Golder predictions.⁴⁰

³⁵ Note that in the EcoMetrix report, they originally recommended an EQC for nitrite of 0.06 mg/L which would not be achievable by the water treatment plant. However, EcoMetrix noted that their model did not account for conversion of nitrite to nitrate and subsequently suggested an EQC of 0.2 mg/L.

³⁶ Page 8, Suggested Effluent Quality Criteria for the Snap Lake Diamond Mine, EcoMetrix Inc, October 19, 2011

³⁷ Paragraphs 14-19, pages 6-7 of De Beers' Response to Interventions, November 21, 2011

³⁸ Snap Lake Model Report, Golder Associates, dated June 2011 and submitted with De Beers' renewal application on June 8, 2011 as Supporting Document 7

³⁹ Conservative substances are those that incur no losses due to chemical reactions or biological degradations including total dissolved solids, many other ions and metals but not including ammonia and nitrite

⁴⁰ Page 13, transcript of Snap Lake Project Public Hearing, December 14, 2011

Dr. Hart acknowledged⁴¹ that the EcoMetrix model was unable to account for two things: 1) any spatial gradient in contaminants across the lake; and 2) any in-lake losses of non-conservative substances like ammonia or nitrite that degrade over time. With respect to the former concern, Dr. Hart states that:

However, we can see from the AEMP monitoring report that there essentially is no spatial gradient across the lake for a conservative substance like total dissolved solids. In other words, Snap Lake is well mixed and that's essentially how we've treated it in our model, as a well-mixed body of water.⁴²

With respect to non-conservative substances like ammonia and nitrite, Dr Hart believes⁴³ that the EcoMetrix model may have over predicted the concentration of those substances in Snap Lake by two or three times. Overall, the Board accepts that EcoMetrix's model is scientifically valid, and that the EQC derived from the model are relevant to the Snap Lake Diamond Mine. Any potential issues relating to using the EcoMetrix model for specific parameters (e.g., ammonia and nitrite) are considered and accounted for on a parameter-specific basis in Appendix C.

Setting EQC

The Board has before it recommendations⁴⁴ for a total of 23 EQC for the renewal licence— 10 more than exist in WL MV2001L2-0002. Of the currently regulated parameters, there are recommendations to lower several EQC—in many cases by an order of magnitude. There are also recommendations to increase two EQC values, making them less stringent than before. De Beers, however, does not believe that any new or amended EQC are necessary at this time and, therefore, has not submitted evidence that specifically supports or refutes the recommendations before the Board. Before making decisions on individual EQCs, the Board has considered the evidence with respect to the overall principles of when a parameter should be regulated by an EQC or not. These principles are discussed below and their application to specific parameters is discussed in Appendix C.

The Policy states⁴⁵ that the Board will set EQC if “Once all reasonable measures have been taken to limit the amount of waste, concerns may still exist about the quantity, concentration and type of waste to be deposited”; however, the word “concern” is not explicitly defined. In De Beers' opinion there is no

⁴¹ Page 13, lines 15-24, transcript of Snap Lake Project Public Hearing, December 14, 2011

⁴² Page 13, transcript of Snap Lake Project Public Hearing December 14, 2011

⁴³ Pages 15, lines 6-10, transcript of Snap Lake Project Public Hearing, December 14, 2011

⁴⁴ EQC recommendations were made by EcoMetrix in its October 19, 2011 submission as well as by AANDC and EC in their interventions dated November 7, 2011 and November 9, 2011 respectively.

⁴⁵ Section 7.2, page 11 of the *Water and Effluent Quality Management Policy*, MVLWB, March 31, 2011

need for an EQC if there is “no concern”⁴⁶ where concern is defined in relation to exceeding “any known effects level”⁴⁷ in the receiving environment. De Beers believes an EQC is required if there is an “immediate concern”⁴⁸ and there is “enough scientific information upon which a WQO or EQC can be developed”⁴⁹. De Beers did not quantify “immediate concern” other than to say that it would involve seeing a “possibility that a CCME water quality guideline was going to be exceeded”⁵⁰. Lastly, De Beers stated that:

The third option lies somewhere between the first and second option in that there may be a need for a new or modified WQO or EQC in the future if modeling predictions are verified and/or depending on the outcome of further scientific study. For these parameters, studies should be completed to determine site-specific WQOs or EQCs for Snap Lake which can be put in place, along with additional source reduction and treatment options if necessary.⁵¹

Under questioning at the public hearing, De Beers was unable to explain when, in its opinion, modeling predictions would be verified to the point that an EQC would be required. De Beers argues that there is no “immediate concern” about any parameter at this time and, therefore, new or amended EQCs are not necessary either because there is “no concern” or because studies to develop site-specific WQOs and EQCs have not yet been completed by De Beers.

Clearly, what is of “concern” is more subjective than scientific fact and the Board solicited opinions from other parties during the public hearing. Dr. Hart of EcoMetrix stated:

I guess I -- in response to that I would say that where there is a demonstrated concern due to future projections that are approaching some defined water quality objective, then -- then definitely you need an EQC to -- to control the situation and -- and to en -- ensure that the objective is not exceeded. In -- in situations where, you know, we're far below any such level of concern it --it's probably not necessary to define an EQC. In -- in some cases, there are perceived concerns. And it can be beneficial to -- to define an EQC simply as a benchmark in those situations so that you can demonstrate that you're -- you're well below it. So there's a certain amount of judgment involved there. But I guess the -- the

⁴⁶ Paragraph 9, page 4 of De Beers’ Response to Interventions, November 21, 2011

⁴⁷ Page 139, Lines 3-6, transcript of Snap Lake Project Public Hearing, December 13, 2011

⁴⁸ Paragraph 9, page 4 of De Beers’ Response to Interventions, November 21, 2011

⁴⁹ Ibid, paragraph 9, pages 4-5

⁵⁰ Page 140 lines 14 to page 142 line 22 transcript of Snap Lake Project Public Hearing, December 13, 2011

⁵¹ Paragraph 9, page 5 of De Beers’ Response to Interventions, November 21, 2011

primary consideration would be if we foresee a potential for exceeding water quality objectives or – or coming close to doing so in the -- in the future, then we need the controls in place.⁵²

When asked to elaborate on how to adequately demonstrate that there is a concern, Dr. Hart stressed the importance of not procrastinating and said that “We definitely don’t want to leave it to the point where we’re exceeding even proposed levels of concern to actually complete the site-specific work”⁵³.

AANDC stated⁵⁴ that parameters whose concentrations in Snap Lake are on an upward trend may warrant regulation through an EQC. However, AANDC also said that if those parameters were unlikely ever to reach a WQO value in the environment then it would be up to the Board to decide whether an EQC is really needed or if continued monitoring is sufficient. EC responded⁵⁵ to the question about when to set an EQC by way of an example of its recommendation for sulfate. EC points out the concentration of sulfate in Snap Lake is above EA predictions but below EC’s draft sulfate guideline value. In EC’s opinion, future sulfate concentrations should be modeled to see if they may exceed the guideline in future and, if so, regulation may be warranted; otherwise the parameter should be monitored.

The Board has considered all the evidence put before it during this renewal process, and applied the Policy to develop the EQC’s as listed in the table below. Detailed reasons for each EQC are provided in Appendix C to these reasons.

| Parameter | EQC in mg/L | |
|--|------------------------|---------------------|
| | Maximum Average | Maximum Grab |
| Total Suspended Sediments | 7 | 14 |
| Ammonia as N | 10 | 20 |
| Nitrite as N | 0.5 | 1 |
| Nitrate as N <i>(up to December 31, 2014)</i> | 22 | 44 |
| Nitrate as N <i>(from January 1, 2015)</i> | 4 | 8 |
| Chloride <i>(up to December 31, 2014)</i> | 310 | 620 |
| Chloride <i>(from January 1, 2015)</i> | 160 | 320 |

⁵² Page 88 line 22 to Page 89 line 16, transcript of Snap Lake Project Public Hearing, December 14, 2011

⁵³ Page 90 line 23 to page 91 line 1, transcript of Snap Lake Project Public Hearing December 14, 2011

⁵⁴ Page 191 line 18 to page 192 line 20, transcript of Snap Lake Project Public Hearing December 14, 2011

⁵⁵ Page 132 line 17 to page 133 line 25, transcript of Snap Lake Project Public Hearing December 15, 2011

| | | |
|------------------------------------|-------|-------|
| Fluoride (from January 1, 2015) | 0.15 | 0.3 |
| Sulphate | 75 | 150 |
| Aluminum | 0.1 | 0.2 |
| Arsenic | 0.007 | 0.014 |
| Chromium | 0.01 | 0.02 |
| Copper | 0.003 | 0.006 |
| Lead | 0.005 | 0.01 |
| Nickel | 0.05 | 0.1 |
| Zinc | 0.01 | 0.02 |

Response Plans for Strontium, Total Dissolved Solids (TDS), and Nitrogen:

During the Environmental Assessment (EA) of the Snap Lake Diamond Mine, predictions were made about the potential environmental effects of the project and, on the basis of those predictions, a determination was made that the project would not have significant adverse effects. Predictions made in 2003 were necessarily based on information available at the time, and the subsequent WL contained requirements for monitoring to verify those predictions as the mine went ahead. Notably, De Beers has used monitoring data to update water quality predictions for both the mine discharge, as well as for Snap Lake, using models developed by Golder Associates that were submitted with the renewal application. Based on these 2011 models, De Beers now predicts that the water quality objective set for TDS during the EA of 350 mg/L will likely be exceeded by 2016. On the basis of this new prediction, De Beers has initiated studies to derive a WQO for TDS that is site-specific for Snap Lake noting that the level of 350 mg/L was set based on effluent predictions at the time instead of on a guideline value or other specific toxicity data. At the same time, De Beers has indicated that it continues to work on improving source control measures to reduce the amount of TDS that is discharged by the mine.

De Beers' self-initiated efforts regarding TDS are consistent with the principles of adaptive management and the Response Framework. Nonetheless, the Board has chosen to require a TDS Response Plan in the renewal WL (Part F, Item 16 and Schedule 5, Item 3) in order to enhance transparency. The TDS Response Plan includes the development of WQOs for chloride and fluoride which are constituents of TDS.

The Board has also required the submission of a Nitrogen Response Plan and a Strontium Response Plan. The Nitrogen Response Plan has similar requirements to the TDS Response Plan in that it calls for the derivation of site-specific WQOs as well as a discussion of options for reducing loadings of nitrogen species including ammonia and nitrate in order to achieve the lowest practical EQC at the site for those parameters. The Board notes that according

to Golder Associates⁵⁶, these contaminants come from blasting and that “Based on the monitoring data the waste rate of explosives in the Mine is high, averaging approximately 25%”. Therefore, enhanced source control of explosives may be possible to reduce loadings to Snap Lake and to meet lower EQC than is currently achievable. At the public hearing, De Beers confirmed that they had already initiated studies to develop a site-specific WQO for nitrate and that they “Are currently taking aggressive steps to improve explosives blasting and materials management practices”⁵⁷. De Beers’ efforts in this regard will be documented in the Nitrogen Response Plan and any improvements to source control will be implemented through the Water Management Plan.

In the case of strontium, there was considerable debate at the public hearing about the published toxicity data that formed the basis of EcoMetrix’s proposed strontium WQO of 0.5 mg/L. As there is currently no guideline value for strontium, EcoMetrix derived a WQO based on the lowest chronic effects threshold in the scientific literature. De Beers submitted a document with its response to interventions that questioned the validity of some of the published strontium toxicity studies and argued that if those questionable studies were not used, the WQO would be much higher. Dr. Don Hart of EcoMetrix agreed that there was “some uncertainty with a critical study” and that a closer look at the low data points was warranted. As discussed in Appendix C, the Board did not derive an EQC for strontium because of the uncertainty in the strontium WQO. However, the evidence was sufficient to question whether further mitigation or source control of strontium was needed at this time. Therefore, the Strontium Response Plan focuses on the derivation of a defensible site-specific WQO and with only a review of potential mitigation measures necessary at this time.

In its comments on the draft WL on March 12, 2012, De Beers proposed revised wording for the content of all of the Response Plans as well as a change in name to “Management Plans”. For the TDS and Nitrogen Response Plans, De Beers’ proposal retained the conditions for the derivation of site-specific WQOs and for discussing actions relating to source control. However, De Beers has recommended removing requirements to discuss options to achieve the lowest practical EQC at the site and stipulated that a review of potential mitigation or treatment options should only occur if WQO derivation continues to predict potential toxicity in Snap Lake:

For instance, in the case of strontium, the first priority is to conduct the necessary testing to remove uncertainty regarding predicted lack of toxicity in Snap Lake. If the testing indicates that toxicity could occur in

⁵⁶ Page 25 of the Snap Lake Mine Site Water Quality Report, Golder Associates, dated June 2011 and submitted with De Beers’ renewal application on June 8, 2011 as Supporting Document 6

⁵⁷ Page 36, lines 21-23, transcript of Snap Lake Project Public Hearing, December 13, 2011

future, these results will serve to direct additional management actions. Otherwise, no further management actions will be required.⁵⁸

The Policy is clear on the dual objectives of protecting water uses through the use of water quality objectives and of minimizing waste through the implementation of reasonable pollution prevention methodology. The Response Plans do not stipulate the implementation of specific management actions, which is why the plans are not entitled “Management Plans” as recommended by De Beers. Rather, the plan requirements ensure that all of the relevant information is collected and available for the Board to consider with respect to contaminants that may be at levels of concern in Snap Lake now or in the future. Therefore, the Board has retained the Response Plan requirements from the draft WL.

In its comments on the draft WL, AANDC stated that all the Response Plans should be due within a year of WL issuance. De Beers, however, prefers a submission date of December 31, 2013 for all three plans stating that:

This is consistent with the position taken by De Beers during the Hearing, given the biological considerations inherent in this testing (e.g., timing of fish reproduction and duration of testing).⁵⁹

The timing suggested by De Beers aligns well with the need to lower EQC for chloride, fluoride, and nitrate in 2014 (as discussed in Appendix C), and the Board acknowledges that biological testing considerations must be taken into account. The Response Plans will be due December 31, 2013, but a report on response planning progress will be required in the Annual Water Licence Report.

Part G and Schedule 6: Conditions Applying to Aquatic Effects Monitoring

Conditions related to aquatic effects monitoring have been substantially reformatted in the renewal WL to both increase consistency with other Type A Water Licences as well as to accommodate the inclusion of a Response Framework. As detailed in Appendix A, some of the sampling requirements that De Beers have under their existing DFO Authorization⁶⁰ for the Snap Lake Mine have been added to the Aquatic Effects Monitoring Program (AEMP) in the renewal WL in an effort to harmonize the two permits. Greater harmonization of aquatic effects monitoring was a request of both DFO and De Beers and is intended to reduce, where possible, duplication of sampling and reporting requirements. Although changes to conditions in Part G of the renewal WL will not affect the amount of monitoring De Beers must perform in a given year,

⁵⁸ Pages 63–64 of De Beers’ Comments on the Draft Water Licence, March 12, 2012

⁵⁹ Page 36, De Beers Comments on the Draft Water Licence, March 12, 2011

⁶⁰ Fisheries Act Authorization SC-00-196

there are increased reporting and planning requirements as discussed below and in Appendix A.

Consistent with the North Pile Management Plan and the Water Management Plan, the objectives that the Board expects the Aquatic Effects Monitoring Program to achieve are stated clearly in Part G, Item 1. These objectives are consistent with those listed for other type A Water Licences as well as with guidance provided by AANDC's *Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories* (June 2009). Also consistent with other WLs as well as AANDC's AEMP guidelines is the requirement for an Aquatic Effects Re-evaluation Report in Part G, Item 7. This report, due every 4 years, is meant to evaluate monitoring data collected since project inception in a more comprehensive manner than is possible in the Annual AEMP Reports. In the Re-evaluation Report, De Beers is also required to update predictions of project-related effects to the environment, and this information can be used in several ways. For example, updated effect predictions will form the basis of changes to the design of the AEMP itself ensuring that monitoring program continues to measure the right things at the right time and in the right places. As well, if the updated predictions indicate that the Water Licence is not protecting the environment in the way envisioned by the Board, the Board will have the information it needs to consider amendments to the WL as appropriate to adjust the conditions of the WL.

The Board notes that De Beers submitted a Five Year Review and Conceptual AEMP Update on September 30, 2010 with the idea that a detailed revision of the AEMP design would follow in 2011. The latter submission was postponed by the Board due to potential changes in the AEMP requirements in the renewal WL. A revised AEMP Design is now due on October 1, 2012 and is to be based on information provided in the Aquatic Effects Re-evaluation Report that is due on the same day. In its response to comments on the draft WL, De Beers requested that the two requirements be merged, as they are dependent on each other. However, the Board notes that having the AEMP Design document separate allows changes to be made to the design as needed during the four years between Re-evaluation Reports. It also allows for reviewers to have a standalone document that describes the sampling and analysis plan for the AEMP.

Finally, as described above in the section on Part B of the WL, requirements for a Response Framework have been added to Part G for aquatic effects monitoring. The revised AEMP Design, due in October 2012, must now include the information needed to link the results of the AEMP to those actions necessary to ensure that project-related effects on the receiving environment remain within an acceptable range. Part G, Item 9 requires the submission of an AEMP Response Plan if any action level is exceeded; the contents of the AEMP Response Plan are consistent with what is described in the Board's draft Response Framework guidelines.

Part H: Conditions Applying to Contingency Plans

No major changes were made to this section of the licence, although some clarity was provided on when and how the Spill Contingency Plan and the Emergency Response Plan should be updated. For changes to specific conditions, please refer to the Reason for Decision Table.

Part I: Conditions Applying to Closure and Reclamation

Considerable changes were made to this section of the Licence to improve the consistency with other type A water licences and the current knowledge and expectations of closure planning for mines within the Mackenzie Valley.

Items 1 and 2 relate to the creation of a Closure and Reclamation Plan (CRP). The previous WL listed specific requirements of the CRP. The current Licence purposely did not include specific requirements and/or a schedule to reflect the fact that the Board is in the final stages of producing CRP guidelines that contain a template of requirements for future CRPs, as well as updated information on reclamation research plans and progress reports. Once the CRP guidelines are finalized and following a review of the updated ICRP submitted as part of this application, the Board may issue a directive (as per Part I Item 1), based on the guidelines, detailing what is required for an updated CRP as well as a due date for submission. Part I, Item 3 of the MV2011L2-0004 was based on the intent of the Part I, Item 8 of MV2001L2-0002. The purpose of the rewording and the intent of this condition is to allow De Beers to provide an update of annual closure and reclamation activities without resubmitting the entire CRP for review. The Progress Report identifies any changes to the CRP; the changes and the Progress Report will be for Board approval. Once approved, the changes identified in the Progress Report can be made to the CRP without having to open up the whole CRP for review.

Part J: Conditions Applying to Modifications

No major changes have been made to the Modifications section, although some wording was changed and a redundant condition was removed.

Surveillance Network Program (SNP)

With the notable exception of the addition of a new chronic toxicity test (as discussed below), the requirements of the SNP are largely unchanged from WL MV2001L2-0002. In order to enhance overall clarity and to be consistent with other Water Licences, the format of how the SNP requirements are listed has been changed. As well, coordinates of sample locations, if known, have been added. Maps have been included that show approximate station locations as a visual aid for all parties. As

requested by SLEMA,⁶¹ the SNP is now much clearer on how the whole lake average of TDS is sampled, measured, calculated, and reported. Finally, the SNP now requires that the monthly reports include graphs showing trends in parameter concentrations in the effluent as well as trends in the whole lake average concentrations of TDS.

In their interventions, both AANDC and EC recommended that the WL contain a new requirement for a chronic toxicity test⁶² on early life stages of rainbow trout. The recommended test looks at toxicity to three life stages of rainbow trout—egg, alevin and fry—with testing times of seven (7), 30 (thirty), or seventy (70) days respectively. AANDC recommended the 70- (seventy) day egg/alevin/fry test be conducted once annually on samples from Snap Lake at the edge of the mixing zone (i.e., SNP 02-20); EC agreed but also recommended testing the whole effluent. In paragraph 30 of its response to interventions, De Beers stated that it was not opposed to conducting the shorter egg/alevin test with the primary rationale that the earlier life stages are more sensitive to parameters of concern like TDS.⁶³ Under questioning by De Beers at the public hearing, EC agreed⁶⁴ that it may be reasonable to start with the egg/alevin test and then, if there was evidence of toxicity, the 70- (seventy) day test including fry could be performed subsequently. However, EC was unable to identify, at this time, a clear pass/fail level for the egg/alevin test that would trigger moving on to the longer test if reached⁶⁵.

Finally, in the EC document of the early life stage toxicity test for rainbow trout, it states that:

Different early life stages can vary in their sensitivity to different toxicants...therefore it is preferable to monitor effects of continuous toxicant exposure on several early life stages, and during the transition from one life stage to the next, to obtain a good estimate of a sublethally safe concentration.⁶⁶

Given the evidence described above and the fact that there have been several unexplained observations⁶⁷ of chronic toxicity in Snap Lake, the Board has decided that it would be prudent to require, on an annual basis, the longer egg/alevin/fry toxicity test on samples from SNP Station 02-20 (at the edge of the mixing zone) in the renewal WL. If after for example two years of testing, the data shows that indeed the shorter egg/alevin test is adequate for measuring chronic toxicity in Snap Lake, De Beers may apply for a change to the Surveillance Network Program at that time.

⁶¹ SLEMA Water Licence Renewal letter, October 18, 2011.

⁶² *Biological Test Method: Toxicity Tests Using Early Life Stages of Salmonid Fish (Rainbow Trout)*, Method EPA 1/RM/28 Second Edition, July 1998, Environment Canada

⁶³ Page 169 line 1 to page 170 line 12, transcript of Snap Lake Project Public Hearing December 15, 2011

⁶⁴ Page 120 line 7 to 12, transcript of Snap Lake Project Public Hearing December 15, 2011

⁶⁵ Page 130 line 10 to page 131 line 16, transcript of Snap Lake Project Public Hearing, December 15, 2011

⁶⁶ Page 4, Environment Canada Method EPS/1/RM/28, July 1998

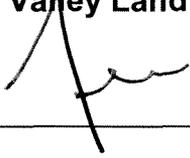
⁶⁷ Page 2-52, 2010 Annual Aquatic Effects Monitoring Program Report, submitted March 2011

Conclusion

Subject to the terms and conditions set out in the Licence, and for the reasons expressed herein, the MVLWB is of the opinion that the licensed undertaking for Water Use and Waste Disposal associated with the Snap Lake Mine can be completed by De Beers Canada Inc. and provide for the conservation, development, and utilization of Waters in a manner that will provide the optimum benefit for all Canadians and in particular for the residents of the Mackenzie Valley.

SIGNATURE

Mackenzie Valley Land and Water Board



Chair

Date April 13, 2012



Witness

Date April 13/12.



DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

| Water Licence MV2011L2-0004 | Review Comment | Proponent Responses | Board Decision | Final Licence MV2011L2-0004 |
|--|---|--|----------------|---|
| Scope | | | | |
| <p>Board Staff notes of clarification to reviewers:</p> <ul style="list-style-type: none"> Proposed addition of conditions c) and d) to be consistent with other Type A water licences Conditions b) and e) were in Part B of the old licence; propose moving them here to be consistent with other Type A water licences | <p>AANDC-WRD thanks the Board for providing the Draft water licence for review. AANDC appreciates the efforts of the Board staff in preparing this draft water licence.</p> | | | |
| | <p>Agreed recommendation: Water Licence term (how many years?) should be specified</p> | <p>De Beers assumes that the Licence term will be specified in the final Licence. For the reasons provided during the Hearing, De Beers recommends an 8 year term.</p> | | |
| | <p>YKDFN asked for a term of 5 years</p> | | | |
| | <p>I didn't notice a licence term. Recommendation: 5 years</p> | <p>Please see above.</p> | | |
| <p>a) This Licence entitles De Beers Canada Inc. (the Licensee) to use Water, dewater the underground mine for the purpose of mining, and to dispose of Waste for diamond mining and milling as outlined in the Consolidated Project Description, submitted by the Licensee on November 24, 2003 (shown specifically in Figures 3 and 5) and summarized below.</p> <p>The Licensee may conduct mining, milling, and associated activities at the Snap Lake Diamond Project Site (63°35'30" N, 110°52'00" W) including:</p> <ol style="list-style-type: none"> the extraction of Waste Rock and ore from the Snap Lake Diamond Mine; the development and operation of site facilities (including the airstrip); the storage of fuel; the development of the North Pile, including the | | | | <p>a) This Licence entitles De Beers Canada Inc. (the Licensee) to use Water, dewater the underground mine for the purpose of mining, and to dispose of Waste for diamond mining and milling as outlined in the Consolidated Project Description, submitted by the Licensee on November 24, 2003 (shown specifically in Figures 3 and 5) and summarized below.</p> <p>The Licensee may conduct mining, milling, and associated activities at the Snap Lake Diamond Project Site (63°35'30" N, 110°52'00" W) including:</p> <ol style="list-style-type: none"> the extraction of Waste Rock and ore from the Snap Lake Diamond Mine; the development and operation of site facilities (including the airstrip); the storage of fuel; the development of the North Pile, including the deposition of Processed Kimberlite; the progressive reclamation of the North Pile; the construction of site roads and laydown areas; |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| <p>deposition of Processed Kimberlite;</p> <p>v. the progressive reclamation of the North Pile;</p> <p>vi. the construction of site roads and laydown areas;</p> <p>vii. the quarrying of materials from specified areas;</p> <p>viii. the construction and maintenance of a winter ice road; and,</p> <p>ix. the use of Water for processing and domestic purposes.</p> | | | | <p>vii. the quarrying of materials from specified areas;</p> <p>viii. the construction and maintenance of a winter ice road; and,</p> <p>ix. the use of Water for processing and domestic purposes.</p> |
| <p>b) This Licence is issued subject to the conditions contained herein with respect to the taking of Water and the depositing of Waste of any type in any Waters or in any place under any conditions where such Waste or any other Waste that results from the deposit of such Waste may enter any Waters. Whenever new Regulations are made or existing Regulations are amended by the Governor in Council under the <i>Northwest Territories Waters Act</i> or other statutes imposing more stringent conditions relating to the quantity or type of Waste that may be so deposited or under which any such Waste may be so deposited, this Licence shall be deemed, upon promulgation of such Regulations, to be automatically amended to conform with such Regulations.</p> | | | <p>This condition was in Part B, Item 1 of MV2001L2-0002; it was moved here for consistency with other Type A water licences.</p> | <p>b) This Licence is issued subject to the conditions contained herein with respect to the taking of Water and the depositing of Waste of any type in any Waters or in any place under any conditions where such Waste or any other Waste that results from the deposit of such Waste may enter any Waters. Whenever new Regulations are made or existing Regulations are amended by the Governor in Council under the <i>Northwest Territories Waters Act</i> or other statutes imposing more stringent conditions relating to the quantity or type of Waste that may be so deposited or under which any such Waste may be so deposited, this Licence shall be deemed, upon promulgation of such Regulations, to be automatically amended to conform with such Regulations.</p> |
| <p>c) The licensee shall take every reasonable precaution to protect the environment;</p> | | | <p>Condition added for consistency with other Type A water licences.</p> | <p>c) The licensee shall take every reasonable precaution to protect the environment;</p> |

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| <p>d) In conducting its activities under this Licence, the Licensee shall make best efforts to consider and incorporate any scientific and Traditional Knowledge that is made available to the Licensee;</p> | | <p>This provision implies that all scientific and Traditional Knowledge that is made available should be incorporated, regardless of its nature.</p> <p>De Beers recommends that this provision be re-worded as follows:</p> <p>“In conducting its activities under this Licence, the Licensee shall make best efforts to consider and incorporate, <i>as appropriate</i>, any scientific and Traditional Knowledge that is made available to the Licensee.”</p> | <p>Condition added for consistency with other Type A water licences.</p> <p>Board Decision: Do not make suggested change. As it stands, condition is reflective of language in the Act, it is consistent with wording from other Type A water licences and the term “best efforts” already covers De Beers’ concern.</p> | <p>d) In conducting its activities under this Licence, the Licensee shall make best efforts to consider and incorporate any scientific and Traditional Knowledge that is made available to the Licensee; and</p> |
| <p>e) Compliance with the terms and conditions of this Licence does not relieve the Licensee from responsibility from compliance with the requirements of all applicable, federal, territorial and municipal legislation.</p> | | | <p>This condition was in Part B, Item 2 of MV2001L2-0002; it was moved here for consistency with other Type A water licences.</p> | <p>e) Compliance with the terms and conditions of this Licence does not relieve the Licensee from responsibility from compliance with the requirements of all applicable, federal, territorial and municipal legislation.</p> |
| <p>Definitions:</p> | | | | |
| <p>Board Staff notes of clarification to reviewers:</p> <ul style="list-style-type: none"> In cases where definitions were not used or were deemed to not provide particular insight they were deleted. The following definitions were deleted: Adaptive Management Plan; Average Monthly Limit; Best Available Technology; Containment and runoff control structure; Effluent; Engineering Geologist; Environmental Management System; F1; F2; Freeboard; Geotechnical engineer; Greywater; Ground ice; IPC metal Scan; Landfill; Landfarm; Mine; Operations; Reclamation; Regulations; Solid waste disposal Facility; Uncontrolled Surface Runoff; Water control and collection system; | <p>A definition of ‘Adaptive Management Plan’ (AdMP) must be included in this section as it is included in binding Recommendations 8 & 9 (and Suggestion 3, 16, 21 & 40) of the Environmental Assessment Report prepared by the MVEIRB. With the removal of the standalone Adaptive Management Plan from this version of the Water Licence, it’s not clear if all of the elements of the AdMP are sufficiently captured elsewhere in the water licence, and whether the introduction of the concepts of “Action Levels”, “Response Framework” and “Response Plans” ensure that MVEIRB’s Recommendations and</p> | <p>De Beers believes that this draft Licence is consistent with the MVEIRB’s recommendations regarding adaptive management, despite different terminology being used and adaptive management measures being incorporated into several management plans, as opposed to a standalone plan. As the term “Adaptive Management” is no longer used in the Licence, De Beers does not recommend inserting a definition, as it would</p> | <p>Board Decision: Do not include definition of Adaptive Management Plan as per De Beers’ response and discussion of Adaptive Management in Part B of Reasons for Decision document.</p> | |

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| <p>Zone of Influence.</p> <ul style="list-style-type: none"> Proposed changes to some definitions to be consistent with other Type A water licences. The following definitions were altered for clarity and consistency: Acid Rock Drainage; Annual Loading; Construction; Dam Safety Guidelines; Discharge; Engineered Structures; Groundwater; Major storm event; Modification; North Pile; Potentially Acid Generating (PAG) Rock; Receiving Environment; Sewage treatment plant; Traditional Knowledge; Waste rock; Water Licence Application; Water Management Pond; Water Supply Facilities; Water Treatment Plant. Proposed new definitions as necessary. The following definitions were added: Action Level; Coarse processed kimberlite; Fine processed kimberlite; North Pile Facility; Paste; Professional Engineer; Response Framework; Response Plan; Unauthorized discharge; Water(s) | <p>Suggestions for an AdMP have been satisfied in this new approach</p> <p>On-site changes to “Containment and runoff control structures” (or Structures intended to contain, withhold, divert or retain Water or Wastes) have recently been proposed by DeBeers. The definition should include IL6 if its construction is ultimately approved by the Board for long term use. Furthermore, the definition of “Water Control and Collection System” should remain in the new Licence.</p> <p>The definition of ‘Average Monthly Limit’ should remain in the water licence since the previous sampling program (SNP) did not monitor metal concentrations frequently enough to determine their Average Monthly concentrations.</p> <p>At all times during operations, the water balance within the Water Management Pond and overall water management at the site must be maintained. Therefore, it is necessary to reinstate the definition for Freeboard which should be maintained at all water storage and collection structures.</p> <p>Recommendations:</p> <p>Add a definition for “Adaptive Management Plan” or include Adaptive Management and</p> | <p>lead to confusion.</p> <p>The previous Licence did not contain a definition of “structures intended to contain, withhold, divert or retain water or wastes”. De Beers does not believe a definition is necessary as this phrase is itself descriptive and self-explanatory. The draft Licence only uses the term “water control and collection system” in one location. As noted in De Beers’ comments below, De Beers recommends that this term be revised to reflect the new phrase suggested by the Board for consistency. A definition for water control and collection system is therefore not necessary.</p> <p>De Beers agrees that the definition of Average Monthly Limit should be re-inserted. De Beers recommends that the definition used in the former Licence be used in the new Licence.</p> <p>As the term “Freeboard” is not used in the draft Licence, De Beers does not recommend inserting a definition. Further, the issue of Freeboard will be addressed in the Water Management Plan and/or the North Pile Management Plan.</p> | <p>Board Decision: Ensure that all references to a “Water Control and Collection System” are replaced by “structures intended to contain, withhold, divert or retain water or wastes”. No further definition is necessary.</p> <p>Board Decision: Re-insert definition into the final WL.</p> <p>Board Decision: Do not include definition.</p> | |
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| | <p>its principles in the definitions for Action Level, Response Framework and Response Plan. By including references to Adaptive Management it would be clear that MVEIRB's Recommendations and Suggestions are still being met.</p> <p>Definition of 'Structures intended to contain, withhold, divert or retain Water or Wastes' and 'Water Control and Collection System' should remain in the water licence.</p> <p>The definition of 'Average Monthly Limit' should remain in the water licence.</p> <p>Definition of 'Freeboard' should remain in the water licence.</p> | | | |
| | <p>Definitions of Water Quality Objectives (WQOs) and Effluent Quality Criteria (EQCs) are missing. They are used in Schedule 5 and Surveillance Network Program</p> <p>Recommendations: Add WQOs and EQCs into the Definitions List</p> | <p>As these terms are defined and discussed in detail in the Board's Water and Effluent Quality Management Policy, De Beers does not believe definitions are necessary in the Licence. However, if definitions are to be used, De Beers recommends that they be made consistent with the Policy.</p> | <p>Board Decision: For clarity, insert the following definition from the Policy: "A numerical concentration or narrative statement that has been established to support and protect the designated uses of water at a specified site"</p> | |
| | <p>Definitions of the following need to be reinstated: Containment and runoff control structure; Deposit; Dewatering; Effluent; "F1"; "F2"; Greywater; Licence; Mine; Operations; Reclamation; Regulations; Water Control and Collection System). Such definitions help the Inspector clearly determine/define when there is a breach of the W.L.</p> <p>Recommendation: Add those definitions (from the old W.L.) into the definitions section of the new W.L.).</p> | <p>See above for De Beers' comments on some of these terms. Regarding the remainder of the terms, De Beers believes that they are descriptive and self-explanatory, or they are not used in the Licence and therefore do not require a definition. If the Board decides that definitions for these terms are necessary it will be important to ensure that they are consistent with legislation, regulations and Board policies and guidelines.</p> | <p>It is unclear what value there is in including definitions for terms not used in the WL.</p> <p>Board Decision: Do not include definitions as suggested by AANDC inspector.</p> | |

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| <p>"Act" means the <i>Northwest Territories Waters Act</i>.</p> | | | <p>Standard and historic condition.</p> | <p>"Act" means the <i>Northwest Territories Waters Act</i>.</p> |
| <p>"Acid Rock Drainage (ARD)" means the production of acidic leachate, Seepage or drainage from underground workings, ore piles, Waste Rock, Processed Kimberlite, or overburden that can lead to the release of metals to groundwater or surface water during the life of the Project and after closure.</p> | | | <p>Standard and historic condition.</p> | <p>"Acid Rock Drainage (ARD)" means the production of acidic leachate, Seepage or drainage from underground workings, ore piles, Waste Rock, Processed Kimberlite, or overburden that can lead to the release of metals to groundwater or surface water during the life of the Project and after closure.</p> |
| <p>"Action Level": A predetermined level of change to a monitored parameter that, if reached or exceeded, requires the Licensee to take appropriate actions including, but not limited to, further investigations, changes to operations, or enhanced mitigation measures.</p> | | <p>While this definition may be appropriate for Action Levels in the Aquatic Effects Monitoring Program, it may not be broad enough to encompass Action Levels in other types of Plans. It is De Beers' understanding that an Action Level could be based in appropriate cases on something other than a change in a monitored parameter.</p> <p>De Beers recommends that this definition be expanded as follows: "A predetermined change to a monitored parameter <i>or other qualitative or quantitative measure</i> that requires the Licensee to take appropriate actions..."</p> | <p>Board Decision: De Beers' suggestion seems to improve the clarity of the definition; use De Beers' suggested wording in final WL.</p> | <p>"Action Level" means a predetermined change to a monitored parameter or other qualitative or quantitative measure that requires the Licensee to take appropriate actions including, but not limited to, further investigations, changes to operations, or enhanced mitigation measures.</p> |
| <p>"Annual Loading" means total mass of a contaminant that is discharged to Snap Lake during a calendar year.</p> | | | <p>Standard and historic condition.</p> | <p>"Annual Loading" means total mass of a contaminant that is discharged to Snap Lake during a calendar year.</p> |
| <p>"Aquatic Effects Monitoring Program" means a monitoring program designed to determine the short- and long-term effects in the Receiving Environment resulting from the Project; to evaluate the accuracy of impact predictions; to assess the effectiveness of planned impact Mitigation Measures; to identify additional impact Mitigation Measures to reduce or eliminate environmental effects; and as further described in PART G Item 1.</p> | <p>Given the number of plans/reports associated with the AEMP, clear definitions of each would be helpful in avoiding any confusion amongst stakeholders when referencing the various documents.</p> <p>Recommendations:</p> <p>EC recommends that definitions be provided for the AEMP Design Plan, Re-Evaluation Report, and AEMP Response Plan for additional clarification.</p> | <p>De Beers appreciates EC's comment. However, it would be difficult to define these terms, as the definitions would likely have to refer to the provisions of the Licence which create these Plans. Given that there are similar plans in other licences, De Beers suggests that generic guidance from the Board would be helpful as to the general purpose of each Plan and how they link together. Also, see De Beers' comment</p> | <p>Board Decision: The main definition is historic and should remain for AEMP. The other AEMP-related plans are sufficiently described in Part G and Schedule 6. Agree with De Beers' that "generic guidance" from the Board would be helpful and this is already a task for Working Group 2.</p> | <p>"Aquatic Effects Monitoring Program" means a monitoring program designed to determine the short- and long-term effects in the Receiving Environment resulting from the Project; to evaluate the accuracy of impact predictions; to assess the effectiveness of planned impact Mitigation Measures; to identify additional impact Mitigation Measures to reduce or eliminate environmental effects; and as further described in PART G Item 1.</p> |

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| | | below regarding combining the AEMP Re-Evaluation Report and AEMP Design Plan into a single document. | | |
| "Average Annual Loading" means the sum of annual loads divided by the number of years for which annual loads are calculated. | | | Standard and historic condition. | "Average Annual Loading" means the sum of annual loads divided by the number of years for which annual loads are calculated. |
| "Board" means the Mackenzie Valley Land and Water Board established under Part 4, Item 99 of the <i>Mackenzie Valley Resource Management Act</i> . | | | Standard and historic condition. | "Board" means the Mackenzie Valley Land and Water Board established under Part 4, Item 99 of the <i>Mackenzie Valley Resource Management Act</i> . |
| "Construction" means any activities undertaken to construct or build any component of, or associated with, the Project. | | | Definition simplified from MV2001L2-0002. | "Construction" means any activities undertaken to construct or build any component of, or associated with, the Project. |
| "Coarse Processed Kimberlite" means the material, generally 1.5 mm to 6 mm in diameter, rejected from the process plant after the recoverable diamonds have been extracted. | | | New definition required due to changes in the Annual Water Licence Report. | "Coarse Processed Kimberlite" means the material, generally 1.5 mm to 6 mm in diameter, rejected from the process plant after the recoverable diamonds have been extracted. |
| "Dam Safety Guidelines" means the <i>Canadian Dam Association's (CDA) Dam Safety Guidelines (DSG), 2007</i> or subsequently approved editions. The scope and applicability of the <i>Dam Safety Guidelines</i> referred to in this Licence, is presented in Section 1 of the <i>Dam Safety Guidelines</i> . | | | Definition updated to reflect more recent guidelines and consistency with other Type A water licences. | "Dam Safety Guidelines" means the <i>Canadian Dam Association's (CDA) Dam Safety Guidelines (DSG), 2007</i> or subsequently approved editions. The scope and applicability of the <i>Dam Safety Guidelines</i> referred to in this Licence, is presented in Section 1 of the <i>Dam Safety Guidelines</i> . |
| "Discharge" means the direct or indirect release of any Water or Waste to the Receiving Environment. | | | Added "or indirect" as per other Type A water licences | "Discharge" means the direct or indirect release of any Water or Waste to the Receiving Environment. |
| "Domestic Waste" means all solid Waste generated from the accommodations, kitchen facilities, and all other site facilities, excluding Processed Kimberlite and Waste Rock. | | | Standard and historic condition. | "Domestic Waste" means all solid Waste generated from the accommodations, kitchen facilities, and all other site facilities, excluding Processed Kimberlite and Waste Rock. |
| "Engineered Structures" means any facility which was designed and approved by a Professional Engineer. | | | Standard and historic condition. | "Engineered Structures" means any facility which was designed and approved by a Professional Engineer. |
| "Environmental Assessment" means, for the purpose of this Licence, the totality of the Mackenzie Valley Environmental Impact Review Board Public Registry as established under the authority of Part 5 of the <i>Mackenzie Valley Resource Management Act</i> for this Licence application. This includes everything that was submitted by De Beers Canada Mining Inc. to the Mackenzie Valley Environmental Impact Review Board, the scope of which is consistent with the Water Licence application. | | | Standard and historic condition. | "Environmental Assessment" means, for the purpose of this Licence, the totality of the Mackenzie Valley Environmental Impact Review Board Public Registry as established under the authority of Part 5 of the <i>Mackenzie Valley Resource Management Act</i> for this Licence application. This includes everything that was submitted by De Beers Canada Mining Inc. to the Mackenzie Valley Environmental Impact Review Board, the scope of which is consistent with the Water Licence application. |
| "Fine Processed Kimberlite" means the material, | | | New definition required due to | "Fine Processed Kimberlite" means the material, |

DFO Comments – Blue
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| generally <0.125 mm in diameter, rejected from the process plant after the recoverable diamonds have been extracted. | | | changes in the Annual Water Licence Report. | generally <0.125 mm in diameter, rejected from the process plant after the recoverable diamonds have been extracted. |
| "Grits Processed Kimberlite" means the material, generally between 0.125 mm and 1.5 mm in diameter, rejected from the process plant after the recoverable diamonds have been extracted. | | | New definition required due to changes in the Annual Water Licence Report. | "Grits Processed Kimberlite" means the material, generally between 0.125 mm and 1.5 mm in diameter, rejected from the process plant after the recoverable diamonds have been extracted. |
| "Groundwater" means all Water below the ground surface. | | | Changed for consistency with other water licences | "Groundwater" means all Water below the ground surface. |
| "Inspector" means a person designated by the Minister under subsection 35(1) of the Act as an Inspector. | | | Standard and historic condition. | "Inspector" means a person designated by the Minister under subsection 35(1) of the Act as an Inspector. |
| "Licensee" means the holder of this Licence. | | | Standard and historic condition. | "Licensee" means the holder of this Licence. |
| "Major Storm Event" means a one (1) in five (5) year rain storm event. | This is the only water licence that includes a definition of "Major Storm Event". AANDC agrees that this definition is better than the previous definition. AANDC would only recommend that a major storm event would be 1:5 yr event and beyond. <u>Recommendation:</u> Change the definition to state, "means equal to or greater than a one (1) in five (5) year rain storm event." | De Beers agrees with this recommendation. | Board Decision: Use AANDC's suggested wording in final WL as it is clearer than in draft WL. | "Major Storm Event" means equal to or greater than a one (1) in five (5) year rain storm event. |
| "Maximum Concentration of Any Grab Sample" means the concentration of any parameter listed in the Licence that cannot be exceeded in any one (1) grab sample. | | | Standard and historic condition. | "Maximum Concentration of Any Grab Sample" means the concentration of any parameter listed in the Licence that cannot be exceeded in any one (1) grab sample. |
| "Metal Leaching" means the production of leachate under neutral or alkaline conditions by Seepage or drainage from underground workings, ore piles, Waste Rock, tailings, or overburden, in either disturbed or undisturbed conditions, that could lead to the release of metals to groundwater and surface water during the life of the Snap Lake Diamond Project and after closure. | | | Standard and historic condition. | "Metal Leaching" means the production of leachate under neutral or alkaline conditions by Seepage or drainage from underground workings, ore piles, Waste Rock, tailings, or overburden, in either disturbed or undisturbed conditions, that could lead to the release of metals to groundwater and surface water during the life of the Snap Lake Diamond Project and after closure. |
| "Mine Plan" refers to the document that describes actual underground mining activities of drilling and blasting, Waste Rock removal, kimberlite extraction, Groundwater control, and backfilling, including the sequencing of the development. | | | Standard and historic condition. | "Mine Plan" refers to the document that describes actual underground mining activities of drilling and blasting, Waste Rock removal, kimberlite extraction, Groundwater control, and backfilling, including the sequencing of the development. |
| "Minewater" means Groundwater or any Water that is pumped or flows out of any underground workings. | | | Standard and historic condition. | "Minewater" means Groundwater or any Water that is pumped or flows out of any underground workings. |
| "Minister" means the Minister of Aboriginal Affairs and | | | Updated to reflect renaming | "Minister" means the Minister of Aboriginal Affairs and |

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| <p>Northern Development Canada.</p> <p>“Modification” in respect of a structure, means a change, other than an expansion, that does not alter the purpose or function of a structure.</p> | <p>The definition needs to be supplemented with wording from the old W.L. which defines the <i>structures</i> which could be modified, i.e., a change <i>“from the design presented to the Board in the WL Application and supporting documents”</i>, other than an expansion, that does not alter the purpose or function of a structure.</p> <p>Recommendation: Change the wording to: <i>In respect of a structure, means a change from the design presented to the Board in the WL Application and supporting documents”, other than an expansion, The scope of changes is limited to changes which don’t alter the purpose or function of a structure.</i></p> | <p>It is unclear why a new definition has been proposed for the term “Modification”. De Beers is concerned that ambiguity in this new definition may have implications on Part J of the Licence. De Beers is also concerned with the Inspector’s recommendation to combine the old and the new definitions, as this could create additional confusion. De Beers recommends the following revision to this definition:</p> <p>“Modification” in respect of a structure previously approved by the Board means a change that does not alter the purpose or function of that structure.</p> | <p>of department</p> <p>This definition comes from the Exemption List Regulations associated with the NWT Water Regulations. In addition, all physical structures on site need to have a design plan and as-built.</p> <p>Board Decision: Use wording in draft WL for final WL.</p> | <p>Northern Development Canada.</p> <p>“Modification” in respect of a structure, means a change, other than an expansion, that does not alter the purpose or function of a structure.</p> |
| <p>“North Pile” is the North Pile Waste Rock and Processed Kimberlite Storage Facility which is comprised of the containment basins and the engineered structures designed to store and contain the Processed Kimberlite and other waste materials, as identified in the Consolidated Project Description Figure 3: Snap Lake Diamond Project Overall Site Plan (November 24th, 2003).</p> | <p>These two terms (“North Pile” and “North Pile Facility”) are so similar that during the course of operations they will be used interchangeably. This will be problematic as the definitions for these two terms are very different. At this time AANDC is not aware of permanent stockpiles of waste rock located at other locations at the site. Even if they were present they would not constitute a facility (see definition below).</p> <p>Recommendation: These two terms should be combined and have one definition for “North Pile”.</p> | <p>De Beers agrees that separate definitions for the “North Pile” and “North Pile Facility” are confusing. De Beers recommends that a single definition for the North Pile be used as follows:</p> <p>“North Pile” is the long-term storage facility for Waste Rock and Processed Kimberlite. The facility comprises containment embankments and perimeter water control structures designed to store and contain the Processed Kimberlite and other waste materials, as identified in the Consolidated Project Description Figure 3: Snap Lake Diamond Project Overall Site Plan (November 24, 2003).</p> | <p>The second definition of North Pile Facility was included to allow us to change the name of the “Ore Storage, Waste Rock, Processed Kimberlite Management Plan” to the “North Pile Management Plan” as requested by reviewers and De Beers. It is our understanding that there have been other stockpiles outside of the North Pile in the past and we did not want to exclude that possibility in the future. Since the definition of “North Pile” is limited by the Consolidated Project Description we felt that adding the definition of North Pile Facility would ensure that if any future waste rock or ore</p> | <p>“North Pile” is the North Pile Waste Rock and Processed Kimberlite Storage Facility which is comprised of the containment basins and the engineered structures designed to store and contain the Processed Kimberlite and other waste materials, as identified in the Consolidated Project Description Figure 3: Snap Lake Diamond Project Overall Site Plan (November 24th, 2003).</p> |

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| | | | <p>stockpiles are made outside of the North Pile itself, their management will be covered by conditions in Part E, Item 6 and other conditions related to the North Pile Management Plan.</p> <p>Board Decision: Leave definition for North Pile as is.</p> | |
| <p>"North Pile Facility" includes the North Pile and any other stockpiles of ore or Waste Rock associated with the Project</p> | <p>The original water licence only defines 'North Pile'.</p> <p>Recommendation:</p> <p>Perhaps separately define Ore Stockpiles and include its location.</p> | <p>Please see above. De Beers recommends that this definition be removed and the Licence only refer to the North Pile throughout. To clarify, there are no other stockpiles of ore or Waste Rock associated with the Project than those contained in the North Pile.</p> | <p>Board Decision: Leave definition for North Pile Facility in the WL.</p> | <p>"North Pile Facility" includes the North Pile and any other stockpiles of ore or Waste Rock associated with the Project</p> |
| <p>"Paste" means a non-segregating, non-bleeding mixture with a high solids content, Water, and possibly cement and/or other additives that is pumped or hauled by truck from the process plant and placed in either the North Pile or underground workings. The solids content may consist of Coarse, Grits, and Fine fractions of Processed Kimberlite.</p> | <p>The previous water licence did not include a definition for "Paste". AANDC agrees that a definition should be included. AANDC is concerned that there still remains some ambiguity in the definition (e.g. "high" solids content, instead of specifying minimum % solids content). However, the terms non-segregating and non-bleeding are helpful in interpretation.</p> <p>It would be good if the Board could provide some discussion and explanation of this definition in its reasons for decision.</p> <p>Recommendation:</p> <p>Please provide some discussion and explanation of this definition in the Reasons for Decision.</p> | <p>De Beers does not agree that a specific water content or water content range should be identified for Paste in the Licence. De Beers recommends that the following descriptive definition be used:</p> <p>"Paste" is a non-segregating, non-bleeding mixture of all three size fractions of Processed Kimberlite and water. Pumping of this material may stop and restart within a pipe. It has a high solids content compared with Slurry. Cement and/or other additives may be added prior to pumping from the process plant to the North Pile or underground workings (as backfill).</p> | <p>A definition for "paste" has been added to the WL because the term is used in Schedule 4, Item 2 concerning the North Pile Management Plan as well as for the Annual Water Licence Report in Schedule 1. The Board did not have evidence on the record in order to set a % water content of paste or slurry.</p> <p>The definition of paste in the draft WL was taken directly from De Beers' response to comments on the water licence renewal application dated August 18, 2011; it is not clear why De Beers wants to change the definition at this stage.</p> <p>Board Decision: Keep the definition of paste as in the</p> | <p>"Paste" means a non-segregating, non-bleeding mixture with a high solids content, Water, and possibly cement and/or other additives that is pumped or hauled by truck from the process plant and placed in either the North Pile or underground workings. The solids content may consist of Coarse, Grits, and Fine fractions of Processed Kimberlite.</p> |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| | | | draft WL for the final WL. | |
| | <p>The Inspector needs something he can measure to determine or monitor compliance. I need "high solids content" defined if I am to unequivocally achieve those goals (or I'll have no choice but to rely on my discretion to assess compliance).</p> <p>Recommendation: Add something easily monitored or measured by the Inspector (so he can confirm compliance or non-compliance). For example, a range of % water content would be useful.</p> | <p>Please see above. De Beers does not agree that specific water content is required to confirm compliance with any provisions of the Licence. The definition suggested above adequately distinguishes Paste from Slurry.</p> | <p>It does not appear as though this is a compliance issue that would need to be determined by the Inspector. Also, there is no evidence on the record to support the definition of a range of %water content for paste.</p> <p>The purpose of including the definitions of paste, slurry, and the different size fractions was to aid reviewers in interpreting technical documents which use these terms.</p> | |
| "Potentially Acid Generating (PAG) Rock" means any rock that has the capability to produce acidic leachate, Seepage, or drainage. | | | Updated definition for clarity | "Potentially Acid Generating (PAG) Rock" means any rock that has the capability to produce acidic leachate, Seepage, or drainage. |
| "Processed Kimberlite" means the material rejected from the process plant after the recoverable minerals have been extracted. | | | Standard and historic condition | "Processed Kimberlite" means the material rejected from the process plant after the recoverable minerals have been extracted. |
| "Professional Engineer" means a person who is registered with the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists in accordance with the <i>Engineering and Geoscience Professions Act</i> , S.N.W.T. 2006, c.16, or subsequently approved editions, as a Professional Engineer, and whose principal field of specialization is appropriate to address the components of the project at hand. | | | Replaces definition of "Engineering Geologist" in MV2001L2-0002 for consistency with other Type A water licences. | "Professional Engineer" means a person who is registered with the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists in accordance with the <i>Engineering and Geoscience Professions Act</i> , S.N.W.T. 2006, c.16, or subsequently approved editions, as a Professional Engineer, and whose principal field of specialization is appropriate to address the components of the project at hand. |
| "Project" means the Snap Lake Diamond Project as outlined in the "Snap Lake Diamond Project Environmental Assessment Report" submitted by De Beers Canada Mining Inc. to the Mackenzie Valley Environmental Impact Review Board February 2002, and updated in the "Consolidated Project Description" submitted to the Board on 24 November 2003, comprising an underground mine and surface processing facilities, surface Waste containment, Water collection and treatment facilities, and other infrastructure; | | | Standard and historic condition | "Project" means the Snap Lake Diamond Project as outlined in the "Snap Lake Diamond Project Environmental Assessment Report" submitted by De Beers Canada Mining Inc. to the Mackenzie Valley Environmental Impact Review Board February 2002, and updated in the "Consolidated Project Description" submitted to the Board on 24 November 2003, comprising an underground mine and surface processing facilities, surface Waste containment, Water collection and treatment facilities, and other infrastructure; |
| "Receiving Environment" means both the aquatic and terrestrial environments that receive any Water or Waste released from the Project. | | The term "terrestrial" should be removed from this definition, as the aquatic environment is the | Although the original De Beers WL MV2001L2-0002 had this definition, other Type | "Receiving Environment" means the aquatic environment that receives any Water or Waste released from the Project. |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| | | <p>focus of this Licence. De Beers appreciates that the aquatic environment can be accessed indirectly through the terrestrial environment. However, this possibility is covered by the definition of "Discharge", which means "the direct or indirect release of any Water or Waste to the Receiving Environment". De Beers notes that the word "indirect" in the definition of Discharge is a new addition to this draft Licence.</p> <p>The addition of the term terrestrial to the definition of Receiving Environment is not consistent with other water licences.</p> | <p>A water licences do not contain a reference to the "terrestrial environment". By updating the definition for Discharge to include "direct or indirect" releases of waste, we have covered the situation in which waste may travel across land before entering water which may have been the reason for including "terrestrial" in this definition originally.</p> <p>Board Decision: Remove "and terrestrial" from this definition in the final WL.</p> | |
| <p>"Response Framework" is a systematic approach to responding when the results of a monitoring program indicate that an Action Level has been reached.</p> | | | <p>Definition added; see discussion in Reasons for Decision on Adaptive Management for further discussion.</p> | <p>"Response Framework" is a systematic approach to responding when the results of a monitoring program indicate that an Action Level has been reached.</p> |
| <p>"Response Plan"- is a part of the Response Framework that describes the specific actions to be taken by the Licensee in response to reaching or exceeding an Action Level.</p> | | | <p>Definition added; see discussion in Reasons for Decision on Adaptive Management for further discussion.</p> | <p>"Response Plan"- is a part of the Response Framework that describes the specific actions to be taken by the Licensee in response to reaching or exceeding an Action Level.</p> |
| <p>"Seepage" includes any Water or Waste that passes through or escapes from any structure designed to contain, withhold, divert, or retain the Water or Waste.</p> | | | <p>Updated for consistency with other Type A water licences.</p> | <p>"Seepage" includes any Water or Waste that passes through or escapes from any structure designed to contain, withhold, divert, or retain the Water or Waste.</p> |
| <p>"Sewage" includes all toilet Wastes and greywater.</p> | | | <p>Standard and historic condition</p> | <p>"Sewage" includes all toilet Wastes and greywater.</p> |
| <p>"Sewage Treatment Plant" means the Engineered Structures that are designed to contain and treat Sewage produced at the Project.</p> | | | <p>Updated to reflect changes at mine site</p> | <p>"Sewage Treatment Plant" means the Engineered Structures that are designed to contain and treat Sewage produced at the Project.</p> |
| <p>"Significance Threshold" means a level of environmental change in any monitored parameter which, if reached, would result in significant adverse effects.</p> | <p>In some instances, significance thresholds have been defined for the Board within the Report of Environmental Assessment for this project (e.g. TDS).</p> <p><u>Recommendation:</u></p> | <p>De Beers recommends that this definition, and use of the term Significance Threshold, be removed from the Licence.</p> <p>The term "significant adverse</p> | <p>Setting Action Levels requires knowledge of what situation we are ultimately trying to avoid. For environmental effects, the situation to be avoided is any significant</p> | <p>"Significance Threshold" means a level of environmental change in any monitored parameter which, if reached, would result in significant adverse effects. This threshold should be consistent with the findings of the</p> |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
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 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| | <p>AANDC recommends reference to the Report of EA for the Snap Lake Mine within this definition.</p> | <p>effect” or “significant adverse impact” is a legal term and it would be inappropriate for conclusions to be made in management plans on when this threshold would be reached. As noted in De Beers’ comments below regarding the AEMP Design Plan, De Beers will be required to establish Action Levels based on potential effects or impacts to the environment, but does not agree that it should be required to draw conclusions on “Significance Thresholds”, particularly given that in many cases the issue has not been previously determined in the EA Report.</p> | <p>adverse effect; therefore, it is really not possible to set Action Levels if you do not first know what the significance threshold is. It is, of course, optimal is significance thresholds are defined in the EA; however, and as discussed in detail in the Board’s draft guidelines for the Response Framework for Aquatic Effects Monitoring, this is not always the case. The guidelines recognize the difficulty in setting significance thresholds during the regulatory phase but still see it as an essential step. AANDC is correct that significance thresholds should be based, as much as possible on predictions, conclusions and other relevant information from the EA.</p> <p>Board Decision: Revise the definition to read: “a level of environmental change in any monitored parameter which, if reached, would result in significant adverse effects. This threshold should be consistent with the findings of the Environmental Assessment of the Snap Lake Diamond Mine (MVEIRB, July 2003)”</p> | <p>Environmental Assessment of the Snap Lake Diamond Mine (MVEIRB, July 2003).</p> |
| | <p>A threshold refers to an absolute level of a monitored parameter that should not be exceeded (not a “level of environmental change”). It should be a quantifiable level not open to interpretation (otherwise, it’s</p> | <p>Please see above.</p> | <p>As noted in the Board’s draft guidelines on the Response Framework, the significance threshold may be also be a narrative statement, it does</p> | |

DFO Comments – Blue
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| | <p>open to the inspectors discretion).</p> <p>Recommendation: Change this definition to <i>“an absolute level or limit for any monitored parameter which, if reached, would results in significant adverse effects to the environment”</i>.</p> | | <p>not have to be a quantifiable number. The significance threshold is only used as a basis for setting the action levels which will likely be quantifiable and much less open to interpretation.</p> <p>Board Decision: No change to definition of significance threshold as described above.</p> | |
| <p>“Slurry” means a mixture of Fine Processed Kimberlite and Water that exhibits liquid-like characteristics and is pumped from the process plant and placed in the North Pile.</p> | <p>See Paste.</p> | <p>Please see De Beers' comment above regarding the definition of “Paste”.</p> <p>De Beers recommends that the following definition be used for “Slurry”:</p> <p>“Slurry” means a mixture of the fines fraction of the Processed Kimberlite and water at a low solids content relative to Paste. It is pumped from the process plant and placed in the North Pile.</p> | <p>A definition for “slurry” has been added to the WL because the term is used in requirements for the Annual Water Licence Report in Schedule 1.</p> <p>The definition in the draft WL is based on the definition given by De Beers in its response to comments on the water licence renewal application (August 18, 2011).</p> <p>Board Decision: Change the definition to the following in order to incorporate the distinction between slurry and paste: “a mixture of Fine Processed Kimberlite and Water that exhibits liquid-like characteristics and has a lower solids content relative to Paste. It is pumped from the process plant and placed in the North Pile.</p> | <p>“Slurry” means a mixture of Fine Processed Kimberlite and Water that exhibits liquid-like characteristics and is pumped from the process plant and placed in the North Pile.</p> |
| <p>“Surveillance Network Program” means the totality of the sampling requirements detailed in Annex A of this Licence.</p> | <p>“Annex A” is not written on the Draft SNP section.</p> <p>Recommendation: Add the words “Annex A” to the SNP.</p> | <p>De Beers agrees with this recommendation.</p> | <p>Board Decision: Add the words “Annex A” to the SNP.</p> | <p>“Surveillance Network Program” means the totality of the sampling requirements detailed in Annex A of this Licence.</p> |
| <p>“Traditional Knowledge” A cumulative, collective body</p> | | | <p>The definition was developed</p> | <p>“Traditional Knowledge” A cumulative, collective body of</p> |

DFO Comments – Blue
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| of knowledge, experience, and values built up by a group of people through generations of living in close contact with nature. It builds upon the historic experiences of a people and adapts to social, economic, environmental, spiritual, and political change. | | | through extensive public hearings and consultation by AANDC as part of the Closure and Reclamation guidelines. It is the definition that is proposed to be used in the CRP Guidelines. Board Decision: Accept this new definition. | knowledge, experience, and values built up by a group of people through generations of living in close contact with nature. It builds upon the historic experiences of a people and adapts to social, economic, environmental, spiritual, and political change. |
| "Unauthorized Discharge" is a release or Discharge of any Water or Waste not authorized under this Licence. | | | Added for consistency with other Type A water licences | "Unauthorized Discharge" is a release or Discharge of any Water or Waste not authorized under this Licence. |
| "Waste" means any substance defined as Waste by section 2 of the Act. | | | Standard and historical condition | "Waste" means any substance defined as Waste by section 2 of the Act. |
| "Waste Rock" means all rock materials that are produced and unprocessed throughout the life of the Project. | | | Updated for consistency with other water licences | "Waste Rock" means all rock materials that are produced and unprocessed throughout the life of the Project. |
| "Water(s)" means any Waters as defined by section 2 of the Act. | | De Beers recommends that this definition be removed. Section 2 of the Act defines waters as "any inland water, whether in a liquid or frozen state, on or below the surface of the land in the Northwest Territories". This definition makes sense if the reference in the Licence is to the water in the receiving environment, but does not make sense in other contexts, such as when the reference in the Licence is to water being discharged from the Project into the receiving environment, or the reference in the Licence is to water being contained or managed within the Project facilities. De Beers believes that the term "water" is self-explanatory and does not require a definition. | Board Decision: Retain definition as this is consistent with other water licences. | "Water(s)" means any Waters as defined by section 2 of the Act. |
| "Wastewater" means the Water that is generated by site activities or originates on site that requires treatment or | | | Standard and historical condition | "Wastewater" means the Water that is generated by site activities or originates on site that requires treatment or any |

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 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| any other water management activity. | | | | other water management activity. |
| "Water Licence Application" for the purpose of this Licence includes the totality of the MVLWB and MVEIRB Public Registries as established as a result of the filing of the application dated February 2, 2001 and the renewal application filed June 8, 2011. | | | Updated to include current renewal process | "Water Licence Application" for the purpose of this Licence includes the totality of the MVLWB and MVEIRB Public Registries as established as a result of the filing of the application dated February 2, 2001 and the renewal application filed June 8, 2011. |
| "Water Management Pond" means the impoundment that was used for the disposal of Processed Kimberlite during the exploration phase but during operations is being used for temporary storage of Water and Waste and as a contingency Water storage area for the Water Treatment Plant effluent. | | De Beers recommends removing the word "effluent" at the end of this definition. It does not become "effluent" until it is discharged into the environment. | It is called effluent once it leaves the treatment plant. Either way it is a technicality and does not change the meaning or interpretation of the definition. Board Decision: Retain definition in draft WL. | "Water Management Pond" means the impoundment that was used for the disposal of Processed Kimberlite during the exploration phase but during operations is being used for temporary storage of Water and Waste and as a contingency Water storage area for the Water Treatment Plant effluent. |
| "Water Supply Facilities" means the Engineered Structures that are required for extraction, storage, treatment, and distribution of water as shown in Figure 4 - Snap Lake Diamond Project Overall Site Plan, Consolidated Project Description, 2003. | | | Standard and historical condition | "Water Supply Facilities" means the Engineered Structures that are required for extraction, storage, treatment, and distribution of water as shown in Figure 4 - Snap Lake Diamond Project Overall Site Plan, Consolidated Project Description, 2003. |
| "Water Treatment Plant" means the Engineered Structures that are designed to collect and treat Waste Water produced from this Project. | | | Updated to be consistent with changes to other definitions. | "Water Treatment Plant" means the Engineered Structures that are designed to collect and treat Waste Water produced from this Project. |
| PART B: GENERAL CONDITIONS | | | | |
| Board Staff notes of clarification to reviewers: <ul style="list-style-type: none"> • Specific requirements of Annual Report have been placed in Schedule 1 • Any proposed changes to conditions as per recommendations or to be consistent with other Type A water licences • Have proposed deletion of requirement for an Adaptive Management Plan (previously Part B, Item 12 in old licence) – as per recommendations, have proposed incorporating adaptive management directly into the North Pile Management Plan, the Water Management Plan and the Aquatic Effects Monitoring Program | See comments above about Adaptive Management Plan. Will the Management Response Framework address the specific items identified in Part B, Items 12 and 13 of the old licence? If so, how? Will a Response Framework be developed for the entire site and Response Plans be developed for the North Pile, Water Management Plan and AEMP? | Please see De Beers' comment above regarding adaptive management measures. | See full discussion on adaptive management in Part B of the Reasons for Decision. | |
| | Recommendations: AANDC recommends that the Board align Adaptive Management and its principles to the alternate definitions proposed in the water licence. Board decisions with respect to Adaptive Management should be described within the Reasons for Decision. | | | |

DFO Comments – Blue
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 AANDC Inspector's Comments – Black
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| | <p>Adaptive Management Plan was accepted by the MVLWB on August 18, 2011. Response Framework is used in the draft Water Licence to replace the concept of Adaptive Management. However, no reference about the linkage between Adaptive Management Plan and Response Framework is provided in the draft document. Response Framework is applied into Waste Management, North Pile Management, Water Management and AEMP. Is it necessary to require a general Monitoring Response Framework document for the Snap Lake Diamond Project?</p> <p>Recommendations: It is recommended that the MVLWB provide a term with regards to their relationship for continuity and ensure the Adaptive Management Plan remains effective until the Response Framework documents are available.</p> | <p>De Beers does not believe such a condition is necessary, as section B 5 of the draft Licence requires De Beers to follow plans approved under the previous Licence unless and until a new or updated plan has been approved by the Board. It is therefore De Beers' understanding that it will operate under its existing Adaptive Management Plan until it is replaced by the measures contained in this Licence.</p> | <p>Comment was appropriately addressed by De Beers. Board Decision: No changes to WL.</p> | |
| | <p>I support incorporating adaptive management triggers into the plans as suggested. But the licence as it stands doesn't detail how the MVLWB proposes to achieve that end, so I can't review/have input into this. Trigger levels & proposed action should be subject to review before approval of the new Licence.</p> <p>I haven't been able to determine if the conditions in the old licence (12 and 13) are still met within the new W.L. The content of 13 in particular needs to be renewed, somewhere, including the condition ensuring that that Inspector or Board can request an update to the adaptive mgt. conditions incorporated within the various plans.</p> <p>Recommendation: Include language which specifically addresses how adaptive management</p> | <p>Please see De Beers' comment above regarding adaptive management measures.</p> <p>As explained during the hearing process, De Beers does not believe it is appropriate for the Licence to contain the details of what the adaptive management measures, including Action Levels, must be. The specific measures will be identified in the various management plans. By specifying that Action Levels are required, but by not dictating what they must be, the Licence strikes an appropriate balance between enforceability and flexibility.</p> | <p>Action levels will be proposed by De Beers in the specific plans required under the licence. These plans will be circulated for review, comment and approval by the Board. There is no evidence at this time to establish Action Levels for the specific plans and so this is most appropriately done through the comment and review process described above.</p> <p>Two of the plans that contain adaptive management - the North Pile Management Plan and the Water Management Plan, all have follow-up conditions that allow the Board to request updates or</p> | |

DFO Comments – Blue
 ENR Comment – Green
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| | <p>triggers are proposed (including proposed levels and actions).</p> <p>Ensure intent of conditions 12 and 13 is included in the water license.</p> | | <p>changes to the plan. If the Inspector wishes to request a change to any approved plan, he/she may make this request, with rationale, to the Board for consideration.</p> <p>The intent of condition 13 is described above. The intent of condition 12 has been captured as described in sections below as well as in Part B of the Reasons for Decision.</p> <p>Board Decision: There is no condition in the draft WL that allows the Board to request changes to the AEMP Design Document. In order to be consistent with other Type A water licences, Board staff recommend including the following condition in Part G: "The Licensee shall review and modify the AEMP Design Plan as necessary to reflect directives from the Board. All modified plans shall be submitted to the Board for approval."</p> | |
| <p>1. The Licensee shall ensure that a copy of this Licence is maintained at the site of operation at all times.</p> | | | <p>Moved from Part B, Item 11 in MV2001L2-0002</p> | <p>1. The Licensee shall ensure that a copy of this Licence is maintained at the site of operation at all times.</p> |
| <p>2. All information submitted to the Board for this Licence must be submitted in a form acceptable to the Board.</p> | <p>Lastly, we have previously requested (March 2011) that de Beers be required to submit all documents in a non-secure digital format that allows Parties much greater ease of use when reviewing. There is no license condition addressing this. YKDFN suggest that this inclusion could occur in Part A.</p> | <p>De Beers notes that Part B, s. 2 of this Licence states that all information submitted to the Board for this Licence must be submitted in a form acceptable to the Board. De Beers believes that this is sufficient for the purposes of the Licence requirements. In its response to</p> | <p>De Beers' response is accurate and the YKDFN may go through the Board if necessary to obtain submissions in a suitable format for review. Also, the MVLWB released, on March 1, 2012, its "Document Submission Standards" that</p> | <p>2. All information submitted to the Board for this Licence must be submitted in a form acceptable to the Board.</p> |

DFO Comments – Blue
 ENR Comment – Green
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| | | Interventions, De Beers agreed to submit electronic raw data for the Water Licence Annual Report and the AEMP Annual Report in Microsoft Excel format. De Beers has also agreed to providing document in both secure and unsecured PDF format. | specifically state that pdf documents must be searchable, printable and the content available for cutting/pasting. <u>Board Decision:</u> No change to WL. | |
| 3. The water use fee shall be paid by the Licensee annually in advance of any Water use. | | | Standard and historic condition | 3 The water use fee shall be paid by the Licensee annually in advance of any Water use. |
| 4. The Licensee shall comply with the terms of any plans approved pursuant to the conditions of this Licence and with any amendments to the plans as may be made from time to time pursuant to the conditions of this Licence and as approved by the Board. | | | New condition based on consistency with other water licences. | 4. The Licensee shall comply with the terms of any plans approved pursuant to the conditions of this Licence and with any amendments to the plans as may be made from time to time pursuant to the conditions of this Licence and as approved by the Board. |
| 5. The Licensee shall follow plans approved under Licence MV2001L2-0002 unless and until a new or updated plan has been approved by the Board. | | | Update of condition Part B, Item 4 of MV2001L2-0002. | 5. The Licensee shall follow plans approved under Licence MV2001L2-0002 unless and until a new or updated plan has been approved by the Board. |
| 6. All revised management plans and monitoring programs submitted to the Board shall include a brief summary of the changes made to the plan. | | | New condition based on consistency with other water licences. | 6. All revised management plans and monitoring programs submitted to the Board shall include a brief summary of the changes made to the plan. |
| 7. The Licensee shall file an Annual Water Licence Report with the Board no later than March 31 of the year following the calendar year reported which shall contain the information in accordance with Schedule 1, Item 1. | | | Update of condition Part B, Item 5 of MV2001L2-0002; old WL listed specifics of report in Part B rather than a Schedule. | 7. The Licensee shall file an Annual Water Licence Report with the Board no later than March 31 of the year following the calendar year reported which shall contain the information in accordance with Schedule 1, Item 1. |
| 8. The Surveillance Network Program and Schedules annexed to this Licence form an integral part of this Licence. | | | New condition based on consistency with other water licences | 8. The Surveillance Network Program and Schedules annexed to this Licence form an integral part of this Licence. |
| 9. The Licensee shall comply with the Surveillance Network Program annexed to this Licence, and any amendment to the Surveillance Network Program | | | Previously Part B, Item 7 of MV2001L2-0002 | 9. The Licensee shall comply with the Surveillance Network Program annexed to this Licence, and any amendment to the Surveillance Network Program made |

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 AANDC Inspector's Comments – Black
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| made from time to time, pursuant to the conditions of this Licence and approved by the Board. | | | | from time to time, pursuant to the conditions of this Licence and approved by the Board. |
| 10. The Licensee shall comply with the Schedules annexed to this licence and with any amendments to the Schedules as may be made from time to time pursuant to the conditions of this Licence and as approved by the Board. | | | New condition based on consistency with other water licences | 10. The Licensee shall comply with the Schedules annexed to this licence and with any amendments to the Schedules as may be made from time to time pursuant to the conditions of this Licence and as approved by the Board. |
| 11. The Schedules, the Surveillance Network Program, and any compliance dates specified in this Licence may be modified at the discretion of the Board. | | | Update of condition Part B, Item 7 of MV2001L2-0002 to include Schedules. | 11. The Schedules, the Surveillance Network Program, and any compliance dates specified in this Licence may be modified at the discretion of the Board. |
| 12. Meters, devices, or other such methods used for measuring the volumes of Water used and Waste Discharged shall be installed, operated, and maintained by the Licensee to the satisfaction of an Inspector. | | | Previously Part B, Item 8 of MV2001L2-0002 | 12. Meters, devices, or other such methods used for measuring the volumes of Water used and Waste Discharged shall be installed, operated, and maintained by the Licensee to the satisfaction of an Inspector. |
| 13. The Licensee shall maintain, to the satisfaction of an Inspector, the signs necessary to identify the stations of the Surveillance Network Program. | | | Update of condition Part B, Item 9 of MV2001L2-0002 | 13. The Licensee shall maintain, to the satisfaction of an Inspector, the signs necessary to identify the stations of the Surveillance Network Program. |
| PART C: CONDITIONS APPLYING TO SECURITY REQUIREMENTS | | | | |
| Board Staff notes of clarification to reviewers: <ul style="list-style-type: none"> • Specific requirements of security amounts have been placed in Schedule 2 • Other changes to wording are proposed as per lessons learned with other Type A water licences | | | | |
| 1. The Licensee shall post and maintain a security deposit in accordance with Schedule 2, Item 1. | | | Update of condition Part C, Items 1--4 of MV2001L2-0002; old WL listed specifics of security amounts rather than placing them in a Schedule. | 1. The Licensee shall post and maintain a security deposit in accordance with Schedule 2, Item 1. |
| 2. The security deposits required under Part C, Item 1 shall be in a form acceptable to the Minister and shall be maintained until such time as it is fully or partially refunded by the Minister | | | Previously Part C, Item 5 of MV2001L2-0002 | 2. The security deposits required under Part C, Item 1 shall be in a form acceptable to the Minister and shall be maintained until such time as it is fully or partially refunded |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| pursuant to Section 17 of the Act. | | | | by the Minister pursuant to section 17 of the Act. |
| <p>3. The Licensee shall upon request from the Board submit an updated security estimate utilizing the current version of RECLAIM or another method acceptable to the Board.</p> | <p>Mine reclamation liability can fluctuate over the duration of the mine life and should be accurately reflected on an annual basis in terms of the amount of security posted.</p> <p>Recommendation: EC recommends, under Part C of the Water Licence, that the mine reclamation liability estimate be re-assessed on an annual basis and security deposit adjusted accordingly.</p> | <p>De Beers notes that the Board has discretion in the draft Licence regarding when updated security estimates must be submitted and when security amounts may be adjusted based on those estimates. De Beers considers this to be appropriate and reasonable, particularly when the Project is not approaching closure in the near future. De Beers does not agree that the mine reclamation liability estimate should be updated on an annual basis.</p> | <p>There are some current Type A WL's that have a condition to report annually, however in consultation with Board staff and members of the closure and reclamation group, it was decided that annual estimates would require considerable resources and effort from the parties involved while providing little benefit. Board staff feels that the draft conditions allow the Board to adjust the security to reflect changes in liability. Therefore there is no need to adjust the security annually.</p> <p>Board Decision: No change to draft WL condition</p> | <p>3. The Licensee shall upon request from the Board submit an updated security estimate utilizing the current version of RECLAIM or another method acceptable to the Board.</p> |
| <p>4. The Licensee shall maintain such further or other security amounts as may be required by the Board based on estimates of current mine reclamation liability in accordance with Part C, Item 3 of this Licence or based on such other information as may be available to the Board.</p> | | | <p>This condition was taken from the Diavik Diamond WL and allows for the security to be adjusted based on current estimates. Although the requirement for annual estimates was removed, for the reasons stated above.</p> | <p>4. The Licensee shall maintain such further or other security amounts as may be required by the Board based on estimates of current mine reclamation liability in accordance with Part C, Item 3 of this Licence or based on such other information as may be available to the Board.</p> |
| <p>5. Reductions to the security deposit may be granted by the Board based on estimates of current mine reclamation liability in accordance with Part C, Item 3 of this Licence or based on such other information as may be available to the Board.</p> | | | <p>This condition was taken from the Diavik Diamond Mine WL, and allows for the reduction in security based on estimates and information made available to the Board.</p> | <p>5. Reductions to the security deposit may be granted by the Board based on estimates of current mine reclamation liability in accordance with Part C, Item 3 of this Licence or based on such other information as may be available to the Board.</p> |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

| PART D: CONDITIONS APPLYING TO CONSTRUCTION | | | | |
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| <p>Board Staff notes of clarification to reviewers:</p> <ul style="list-style-type: none"> The term "water containment and runoff control structures" was used inconsistently in the old licence; have proposed changing that term to structures "intended to contain, withhold, divert or retain Water or Wastes" both for clarity and for consistency with other Type A water licences Detailed design report requirements have not changed but have been moved to Schedule 3 for clarity other proposed changes to conditions are based on recommendations or to be consistent with other Type A water licences | <p>I support the proposed changes (to the left). Though I object to the wording that the term was applied inconsistently (it was applied consistently, De Beers just objected with the Inspectors' interpretation).</p> | | <p>Board staff meant to say that the term "water containment and runoff control structures" was not used in every condition of the WL; instead the words were often mixed up or changed and did not refer to the defined term in MV2001L2-0002</p> | |
| <p>1. The Licensee shall ensure that all Engineered Structures intended to contain, withhold, divert, or retain Water or Wastes are designed, constructed, and maintained to prevent escape of Wastes to the Receiving Environment.</p> | | | <p>Update of Part D, Item 3 of MV2001L2-0002 using newly defined terms.</p> | <p>1. The Licensee shall ensure that all Engineered Structures intended to contain, withhold, divert, or retain Water or Wastes are designed, constructed, and maintained to prevent escape of Wastes to the Receiving Environment.</p> |
| <p>2. The Licensee shall ensure that Construction records of Engineered Structures are maintained and made available at the request of the Board and/or an Inspector.</p> | | | <p>Update of Part D, Item 11 of MV2001L2-0002 using newly defined terms.</p> | <p>2. The Licensee shall ensure that Construction records of Engineered Structures are maintained and made available at the request of the Board and/or an Inspector.</p> |
| <p>3. The Licensee shall submit to the Board, within thirty (30) days of the issuance of the Licence, an update to the schedule for Construction and mine development.</p> | | <p>De Beers recommends that this provision be removed, as it is unclear as to why a renewal of a Licence would require this submission. De Beers is already required to provide a summary of construction activities and an updated Mine Plan in the Water Licence Annual Report.</p> | <p>This update to the construction schedule is meant to address future construction and development while the annual report requirement only summarizes the previous year's activities.</p> <p>Board Decision: Clarify condition by changing wording to: "The Licensee shall submit to the Board an</p> | <p>3. The Licensee shall submit to the Board an update to the schedule for Construction and mine development upon request from the Board.</p> |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| | | | update to the schedule for Construction and mine development upon request from the Board.” | |
| 4. The Licensee shall ensure that all structures intended to contain, withhold, divert, or retain Water or Wastes are designed, Constructed, and maintained to meet or exceed the <i>Dam Safety Guidelines</i> . | | | New condition to be consistent with other water licences. | 4. The Licensee shall ensure that all structures intended to contain, withhold, divert, or retain Water or Wastes are designed, Constructed, and maintained to meet or exceed the <i>Dam Safety Guidelines</i> . |
| 5. The Licensee shall submit to the Board a minimum of ninety (90) days prior to the start of Construction of any phase of the North Pile, the Final Detailed Design Report, Construction drawings and specifications, and a Quality Control Plan stamped by a Professional Engineer. The Final Detailed Design Report shall comply with Schedule 3, Item 1. | | | Update of condition Part D, Item 1 of MV2001L2-0002; old WL listed specifics of report in Part D rather than in a Schedule. | 5. The Licensee shall submit to the Board a minimum of ninety (90) days prior to the start of Construction of any phase of the North Pile, the Final Detailed Design Report, Construction drawings and specifications, and a Quality Control Plan stamped by a Professional Engineer. The Final Detailed Design Report shall comply with Schedule 3, Item 1. |
| 6. The Licensee shall submit to the Board a minimum of ninety (90) days prior to the start of Construction of any structures intended to contain, withhold, divert, or retain Water or Wastes not included in the North Pile system covered by Part D, Item 5; the Final Detailed Design Report, Construction drawings and specifications, and a Quality Control Plan stamped by a Professional Engineer. The Final Detailed Design Report shall comply with Schedule 3, Item 2. | EC recommends, under Part D, item 6, that the statement be revised to reflect the following: "...a Quality Control Plan stamped by a certified Professional Engineer". | De Beers does not agree with this recommendation, as a "Professional Engineer" is defined in the legislation as a person who is registered with the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists. Registration requires that such a person holds a Professional Engineer's License. | Update of condition Part D, Item 4 of MV2001L2-0002; old WL listed specifics of report in Part D rather than in a Schedule. The definition of Professional Engineer requires that the engineer be registered in the NWT. Board Decision: No change to draft WL. | 6. The Licensee shall submit to the Board a minimum of ninety (90) days prior to the start of Construction of any structures intended to contain, withhold, divert, or retain Water or Wastes not included in the North Pile system covered by Part D, Item 5; the Final Detailed Design Report, Construction drawings and specifications, and a Quality Control Plan stamped by a Professional Engineer. The Final Detailed Design Report shall comply with Schedule 3, Item 2. |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| <p>7. The Licensee may commence Construction of structures in Part D, Items 5 and 6 and other related Engineered Structures provided the following requirements are met:</p> <ul style="list-style-type: none"> a. The Licensee has notified the Board in writing of proposed Construction activities/work at least thirty (30) days prior to the beginning of the activities; b. Such activities do not place the Licensee in contravention of either the Licence or the Act; c. The Board has not, during the thirty (30) days following notification of the proposed Construction activities, informed the Licensee that review of the proposal will require additional time; d. The Board has not rejected the proposed Construction activities; and e. An Inspector's approval has been given. | | | <p>Update of Part D, Item 5 of MV2001L2-0002</p> | <p>7. The Licensee may commence Construction of structures in Part D, Items 5 and 6 and other related Engineered Structures provided the following requirements are met:</p> <ul style="list-style-type: none"> a. The Licensee has notified the Board in writing of proposed Construction activities/work at least thirty (30) days prior to the beginning of the activities; b. Such activities do not place the Licensee in contravention of either the Licence or the Act; c. The Board has not, during the thirty (30) days following notification of the proposed Construction activities, informed the Licensee that review of the proposal will require additional time; d. The Board has not rejected the proposed Construction activities; and e. An Inspector's approval has been given. |
| <p>8. Construction of Engineered Structures for which all the conditions in Part D, Item 7 have not been met may be carried out only with written approval from the Board.</p> | | | <p>Previously Part D, Item 7 of MV2001L2-0002</p> | <p>8. Construction of Engineered Structures for which all the conditions in Part D, Item 7 have not been met may be carried out only with written approval from the Board.</p> |
| <p>9. The Licensee shall provide written notification to an Inspector a minimum of forty-eight (48) hours prior to the commencement of Construction. This shall include the name and contact information for the Construction superintendent.</p> | <p>Construction of what? That needs to be specified. Recommendation: Add "construction of Part 5 (5 & 6) and other related engineered structures.</p> | <p>De Beers does not believe a clarification is necessary as "Construction" is a defined term.</p> | <p>Update of condition Part D, Item 10 of MV2001L2-0002. Construction is now a defined term. Board Decision: Retain</p> | <p>9. The Licensee shall provide written notification to an Inspector a minimum of 48 (forty-eight) hours prior to the commencement of Construction. This shall include the name and contact information for the Construction superintendent.</p> |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
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 AANDC Inspector's Comments – Black
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| <p>10. The Licensee shall within ninety (90) days of completion of any structures intended to contain, withhold, divert or retain Water or Wastes, submit to the Board, a Geotechnical Engineering Report prepared by a Professional Engineer. This shall include as-built drawings, documentation of field decisions that deviate from the Final Detailed Design report original plans, and any data used to support these decisions.</p> | | | <p>wording of draft WL. Update of condition Part D, Item 8 of MV2001L2-0002.</p> | <p>10. The Licensee shall within 90 (ninety) days of completion of any structures intended to contain, withhold, divert, or retain Water or Wastes, submit to the Board, a <i>Geotechnical Engineering Report</i> prepared by a Professional Engineer. This shall include as-built drawings, documentation of field decisions that deviate from the Final Detailed Design Report original plans, and any data used to support these decisions.</p> |
| <p>11. The Licensee shall ensure that all Construction of Engineered Structures will be supervised and field checked by a Professional Engineer.</p> | | | <p>Previously captured in Part D, Item 11 of MV2001-L2-0002</p> | <p>11. The Licensee shall ensure that all Construction of Engineered Structures will be supervised and field checked by a Professional Engineer.</p> |
| <p>PART E: CONDITIONS APPLYING TO WASTE MANAGEMENT</p> | | | | |
| <p>Board Staff notes of clarification to reviewers:</p> <ul style="list-style-type: none"> We have proposed rolling the requirements for a Hazardous Materials Plan and a Domestic Waste and Sewage Management Plan, and landfarming of hydrocarbon contaminated soils into a single Waste Management Plan. According to the guidelines, the plan will generally describe how all waste is handled but may reference more specific plans if appropriate (i.e., no need to repeat detailed information available in other documents) Specific requirements for the Geochemical and Geotechnical Inspection Report, the North Pile Management Plan, the ARD and Geochemistry Plan and the seepage surveys has been moved to Schedule 4 other proposed changes to conditions are based | <p>In the current WL, Condition 19 states that “the Licensee shall re-evaluate the Best Available Technology for treatment of the effluent discharged to Snap Lake and submit their findings to the Board as part of their application for any subsequent WL’s for the Snap Lake Diamond Project.” It appears that this condition has been removed. Recommendation: DFO recommends that the requirement for the re-evaluation of Best Available Technologies for the treatment of the effluent discharged to Snap Lake be maintained and that this condition should be altered to require DBCI to demonstrate how BATs are re-evaluated on a frequency that is acceptable to the MVLWB.</p> | <p>De Beers notes that the Response Plans required under Part F of the draft Licence contemplates a discussion of mitigation and treatment options. However, De Beers is not opposed to <u>Part F</u> (as opposed to Part E) of the Licence retaining the same provision as was previously in the Licence as follows: “The Licensee will re-evaluate the Best Available Technology for the</p> | <p>Board staff are unsure of whether to include or not. It does feel like a lot of this work is covered in the response plans for TDS, Strontium and Nitrogen. Board Decision: Include the requirement for a BAT analysis but make it “at the request of the Board.” In this case, the definition should be re-inserted into the WL and this condition should actually go into Part F.</p> | |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
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 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| <p>on recommendations or to be consistent with other Type A water licences</p> | | <p>treatment of the effluent discharged to Snap Lake and submit their findings to the Board as part of their application for any subsequent water licences for the Project”.</p> <p>If the above provision is to be retained, De Beers recommends that the definition of Best Available Technology be re-inserted into the Licence as follows:</p> <p>“Best Available Technology” means the most effective and economically-achievable technology.</p> <p>If the above definition is not re-inserted into the Licence, it must otherwise be made clear that it is best available technology <i>economically achievable</i> that must be re-evaluated.</p> | | |
| | <p>AANDC recommends that a clause be added within the water licence in regards to the commencement of paste deposition into the North Pile. In their letter dated February 15, 2011, DBCMI stated that they are working towards a June 2012 timeframe for the deposition of paste into the North Pile.</p> <p>AANDC has raised concern in the past and at the recent water licence renewal hearings in regards to the continued deposition of slurry into the North Pile,</p> | <p>De Beers does not agree with this recommendation. Such a provision is unnecessary and would restrain operational flexibility. De Beers cannot guarantee that, even after paste deposition commences, slurry will never be produced (see De Beers’ response to IR #44 for example). De Beers reiterates its plans for the production and deposition of paste as described</p> | <p>Having a set date in the WL does not really address the issue. The real issue is the volume of water in the North Pile, which we have tried to address with the North Pile Management Plan. Specifically, the annual reporting of the volumes of water in the North Pile, and the proposed monitoring within the North Pile to determine physical</p> | |

DFO Comments – Blue
 ENR Comment – Green
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 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| | <p>instead of paste. These concerns will not be reiterated in this submission. It is not unreasonable to request that a date for the commencement of paste deposition be formalized within the water licence.</p> <p>Recommendation:</p> <p>AANDC recommends that a date of July 1, 2012 be placed in the water licence for the commencement of paste deposition in the North Pile, and the end of slurry deposition.</p> | <p>during the hearing.</p> | <p>parameters within the starter cell. The key is to ensure that when the reports are submitted that they have appropriately addressed the intent of the conditions.</p> <p>Board Decision: Do not include a date for the commencement of paste deposition.</p> | |
| | <p>Which management plan should contain information related to <u>paste backfilling (to the underground) of processed kimberlite?</u></p> <p>Recommendation:</p> <p>The general backfilling information should be put into Waste Management Plan, and specific information included in the Closure and Reclamation Plan. The reason is that backfilling could be regarded as progressive reclamation program.</p> | <p>This information is required by the Water Licence Annual Report. To avoid duplication, De Beers does not agree with this recommendation.</p> | <p>The deposition of paste in the underground does seem to be more of a closure issue than an operational issue. SLEMA is encouraged to bring this up when reviewing the closure plan. However, progressive reclamation is also a concern. Currently the only requirement in the Water Licence Annual Report is to report how much paste has been placed underground.</p> <p>Board Decision: Given the number of concerns expressed about the deposition of paste in both the underground and the North Pile, it may be logical to include another reporting requirement in the Water Licence Annual Report (Schedule 1, Item 1 r): "A summary of investigations</p> | |

DFO Comments – Blue
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 YKDFN Comments- Dark Red

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| | | | or activities related to Paste deposition including an updated schedule for Paste deposition in underground and the North Pile.” | |
| | I support the proposed changes (as long as it contains the same conditions for each of those plans which were included in the 2004 W.L.). | Please see above. | | |
| <p>1. The Licensee shall submit to the Board for approval by January 31, 2014 a Waste Management Plan in accordance with the Mackenzie Valley Land and Water Board's <i>Guidelines for the Development of a Waste Management Plan</i>, December 2010, or subsequent editions. The plan shall:</p> <p>a) Describe how all Waste streams associated with the Project are handled, including references to other plans as necessary;</p> <p>b) Describe in detail the process for handling any Waste stream not specifically described in another management plan including, but not limited to, the hydrocarbon-contaminated soils; and</p> <p>c) Incorporate the Domestic Waste and Sewage Plan as well as the Hazardous Waste Management Plan as previously approved under MV2001L2-0002.</p> | <p>Why so far off (2014?). An earlier date would seem more reasonable. All the waste plans already exist & all that's needed in an amalgamation of the plans into one (which I think is a great idea).</p> <p>Recommendations:</p> <p>Change 2014 to January 31, 2013. Preferably earlier.</p> | <p>De Beers is not opposed to the due date for the Waste Management Plan being January 31, 2013 but note that this is the same date as the ARD and Geochemical Characterization Plan, the North Pile Management Plan and the Plume Characterization Study (see below) are due while the Update to the Water Management Plan is due October 01, 2013, thus the January 31, 2014 date may make sense in terms of Board and other resources available to review these reports.</p> | <p>See discussion in Part E of the Reasons for Decision. Replaces Part E, Items 10, 13 and 14 as well as Part E, Item 3j) and 3k) in MV2001L2-0002.</p> <p>Board staff note that the Domestic Waste and Sewage Plan as well as the Hazardous Waste Plan were updated and approved in 2010. As pointed out by De Beers, the intent of staggering the dates is to spread out the work load provide for all parties. The other plans due in 2013 were deemed to be more urgent than the Waste Management Plan.</p> <p>Board Decision: Retain date in draft WL.</p> | <p>1. The Licensee shall submit to the Board for approval by January 31, 2014 a Waste Management Plan in accordance with the Mackenzie Valley Land and Water Board's <i>Guidelines for the Development of a Waste Management Plan</i>, December 2010, or subsequent editions. The plan shall:</p> <p>a) Describe how all Waste streams associated with the Project are handled, including references to other plans as necessary;</p> <p>b) Describe in detail the process for handling any Waste stream not specifically described in another management plan including, but not limited to, the hydrocarbon-contaminated soils; and</p> <p>c) Incorporate the Domestic Waste and Sewage Plan as well as the Hazardous Waste Management Plan as previously approved under MV2001L2-0002.</p> |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
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 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| <p>2. The Licensee shall submit to the Board for approval updates of the Waste Management Plan at the following times:</p> <ul style="list-style-type: none"> a) If the Licensee seeks changes to the plan; b) Every three (3) years following approval of the plan; or c) Upon the request of the Board. | | | <p>New condition to clarify when plans have to updated.</p> | <p>2. The Licensee shall submit to the Board for approval updates of the Waste Management Plan at the following times:</p> <ul style="list-style-type: none"> a. If the Licensee seeks changes to the plan; b. Every three (3) years following approval of the plan; or c. Upon the request of the Board. |
| <p>3. The Licensee shall ensure that all structures designed to contain, withhold, retain, or divert Water or Waste are inspected annually during the summer months by a Professional Engineer, in accordance with the approved relevant Final Detailed Designs, as-built reports, and management and monitoring plans. The results of the annual inspection shall be reported as follows:</p> <ul style="list-style-type: none"> a) The Engineer's Field Inspection Report shall be submitted to the Board within sixty (60) days of the inspection; it shall include a covering letter from the Licensee outlining an implementation plan for addressing each of the Engineer's recommendations; and b) The Engineer's full Geochemical and Geotechnical Inspection Report shall satisfy the requirements of Schedule 4, Item 1 and be submitted to the Board by March 31 of the year following the inspection . | | <p>De Beers recommends that the Licensee's covering letter to the Engineer's Field Inspection Report be required to outline an implementation plan for addressing each of the <i>priority</i> recommendations of the Engineer.</p> | <p>Update to Part E, Item 1; some details have been moved to a schedule and time for submission of field report has been increased from 30 to 60 days as per De Beers' request. Note that the requirement previously listed as Part B, Item 5.1) is now captured in the current Item 3b).</p> <p>What constitutes a "priority" is very subjective. If De Beers does not have a detailed implementation for those recommendations it feels are not of high priority, the condition as stated does not preclude saying that in the required cover letter.</p> <p>Board Decision: Retain draft WL language.</p> | <p>3. The Licensee shall ensure that all structures designed to contain, withhold, retain, or divert Water or Waste are inspected annually during the summer months by a Professional Engineer, in accordance with the approved relevant Final Detailed Designs, as-built reports, and management and monitoring plans. The results of the annual inspection shall be reported as follows:</p> <ul style="list-style-type: none"> a) The <i>Engineer's Field Inspection Report</i> shall be submitted to the Board within 60 (sixty) days of the inspection; it shall include a covering letter from the Licensee outlining an implementation plan for addressing each of the Engineer's recommendations; and b) The Engineer's full <i>Geochemical and Geotechnical Inspection Report</i> shall satisfy the requirements of Schedule 4, Item 1 and be submitted to the Board by March 31 of |

DFO Comments – Blue
 ENR Comment – Green
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 AANDC Inspector's Comments – Black
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| 4. The Licensee shall provide written notification to an Inspector a minimum of two (2) weeks prior to the Engineer's annual inspection conducted as per Part E, Item 3. | This is crucial & will enable the Inspector to coordinate inspection timing with the presence of tie Engineer. | | New condition intended to help with issues raised by the AANDC inspector during this process. | 4. The Licensee shall provide written notification to an Inspector a minimum of two (2) weeks prior to the Engineer's annual inspection conducted as per Part E, Item 3. |
| 5. The Licensee shall maintain all structures designed to contain, withhold, retain, or divert Water or Waste in a manner consistent with the detailed design specifications and as-built reports, so as to prevent the escape of Waste. Weekly inspections of these structures shall be conducted and the records of these inspections shall be kept for review upon the request of the Inspector. The Licensee shall perform more frequent inspections at the request of an Inspector. | <p>It is unclear as to who will be carrying out the weekly inspections (?).</p> <p>Recommendation:</p> <p>EC recommends under Part E, Item 5 that it is clearly stated as to who is expected to carry out the weekly inspections, i.e. a professional engineer, site manager, etc.</p> | <p>De Beers does not agree that this recommendation is necessary and suggests that the person who will carry out inspections be identified in the appropriate management plan.</p> <p>De Beers notes that weekly inspections are already required; therefore, De Beers recommends that more frequent inspections at the request of an Inspector only be required in exceptional circumstances.</p> | <p>Update to condition in Part E, Item 2 of MV2001L2-0002.</p> <p>The intent of the inspection is to identify leaks on the water containment and control structures. Therefore the inspections do not require a Professional Engineer. Discretion of who will conduct the surveys should be left to the proponent. Discretion for when more frequent inspections are necessary rests with the Inspector.</p> <p>Board Decision: Retain draft WL language.</p> | 5. The Licensee shall maintain all structures designed to contain, withhold, retain, or divert Water or Waste in a manner consistent with the detailed design specifications and as-built reports, so as to prevent the escape of Waste. Weekly inspections of these structures shall be conducted and the records of these inspections shall be kept for review upon the request of the Inspector. The Licensee shall perform more frequent inspections at the request of an Inspector. |
| 6. The Licensee shall construct, operate, and maintain the North Pile Facility to design specifications such that: a) Impacts to the Receiving Environment are prevented or minimized through the use of appropriate mitigation measures, | <p>This clause should include an additional reference to Part D, Item 4.</p> <p>This clause should state that no surface or free (pooled) water should be allowed within</p> | <p>De Beers is not opposed to the first recommendation regarding a reference to Part D, Item 4, but note that it is redundant.</p> <p>De Beers does not agree with the second recommendation. De</p> | <p>New condition – see discussion in Part E of Reasons for Decision.</p> <p>Part D, Item 4 requires structures like the North Pile Facility to be designed,</p> | 6. The Licensee shall construct, operate, and maintain the North Pile Facility to design specifications such that: a) Impacts to the Receiving Environment are prevented or minimized through the use of |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
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| <p>monitoring, and follow-up actions;</p> <p>b) Conditions for eventual closure and reclamation of the facility are optimized;</p> <p>c) Monitoring of the facility is sufficient to ensure that:</p> <ul style="list-style-type: none"> i. performance design criteria, as described in the Final Detailed Design documents described in Part D, Item 5, are being met; and ii. changes in operation of the facility, including any necessary additional mitigations, are identified. <p>d) A Response Framework is in place to ensure that the Licensee will take appropriate actions if Action Levels, as defined in the North Pile Management Plan, are exceeded.</p> | <p>the North Pile unless assessed and approved by a Professional Engineer.</p> <p><u>Recommendation:</u></p> <p>Part E, Item 6 I should also reference Part D, Item 4.</p> <p>Add, as Part E, Item 6 I the North Pile will not contain free (pooled) water unless the facility has been assessed and approved to hold free water by a Professional Engineer.</p> | <p>Beers must operate the North Pile as per design specifications. This type of requirement is addressed within the design specifications and the operating manual.</p> | <p>constructed and maintained according to the Dam Safety Guidelines; it does seem redundant to repeat that here.</p> <p>It is the responsibility of the engineer responsible for the function of the North Pile to determine if and when pooled water is consistent with design specifications. If anyone finds reason to object, then it should be brought up in the review of the North Pile Management Plan or the annual report.</p> <p>Board Decision: Retain draft WL language.</p> | <p>appropriate mitigation measures, monitoring, and follow-up actions;</p> <p>b) Conditions for eventual closure and reclamation of the facility are optimized;</p> <p>c) Monitoring of the facility is sufficient to ensure that:</p> <ul style="list-style-type: none"> i. performance design criteria, as described in the Final Detailed Design documents described in Part D, Item 5, are being met; and ii. changes in operation of the facility, including any necessary additional mitigations, are identified. <p>d) A Response Framework is in place to ensure that the Licensee will take appropriate actions if Action Levels, as defined in the <i>North Pile Management Plan</i>, are exceeded.</p> |
| <p>7. The plan referred to as the Ore Storage, Waste Rock, Processed Kimberlite Management Plan in Part E, Item 3 of Water Licence MV2001L2-0002 (as approved by the Board on February 5, 2010), shall be referred to as the North Pile Management Plan in this Licence.</p> | <p>Applause.</p> | | <p>The name of the plan was changed as per requests from De Beers and other reviewers. This condition ensures that, in future, people will understand the name change.</p> | <p>7. The plan referred to as the <i>Ore Storage, Waste Rock, Processed Kimberlite Management Plan</i> in Part E, Item 3 of Water Licence MV2001L2-0002 (as approved by the Board on February 5, 2010), shall be referred to as the <i>North Pile Management Plan</i> in this Licence.</p> |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| <p>8. The Licensee shall submit to the Board, for approval, updates of the North Pile Management Plan at the following times:</p> <ul style="list-style-type: none"> a) A minimum of ninety (90) days prior to the commencement of the construction of any phase of the North Pile Facility; b) If the Licensee seeks changes in the operation or monitoring of the North Pile; c) Every three (3) years following approval of the plan; or d) Upon the request of the Board. <p>Updates to the North Pile Management Plan shall describe how the Licensee is meeting the objectives listed in Part E, Item 5 of the Licence and satisfy the requirements of Schedule 4, Item 2.</p> | <p>Updates to the North Pile Management Plan should be stamped by a Professional Engineer.</p> <p>Recommendation:</p> <p>Add, "stamped by a Professional Engineer" after updates to the North Management Plan.</p> | <p>De Beers is not opposed to this recommendation.</p> <p>De Beers recommends that s. 8(b) be revised to reflect the provision in the previous Licence to the effect that any proposed changes in operation that do not significantly alter design intent can be submitted to the Inspector for approval, as opposed to the Board.</p> | <p>Update to condition Part E, Item 3 and 8 of MV2001L2-0002; details of plan content have been moved to a schedule and the timing of updates has been further clarified.</p> <p>Any changes to the management plan require Board approval.</p> <p>Regarding the 'Stamp' it is unclear what the benefit to this recommendation would be. All structures, changes to structures and inspections of structures already require an Engineers approval. The content of the management plan may exceed the scope that a given Engineer is willing to sign off on. We do not want to complicate writing of the plan.</p> <p>Board Decision: Retain draft WL language.</p> | <p>8. The Licensee shall submit to the Board, for approval, updates of the <i>North Pile Management Plan</i> at the following times:</p> <ul style="list-style-type: none"> a. A minimum of ninety (90) days prior to the commencement of the construction of any phase of the North Pile Facility; b. If the Licensee seeks changes in the operation or monitoring of the North Pile; c. Every three (3) years following approval of the plan; or d. Upon the request of the Board. <p>Updates to the <i>North Pile Management Plan</i> shall describe how the Licensee is meeting the objectives listed in Part E, Item 5 of the Licence and satisfy the requirements of Schedule 4, Item 2.</p> |
| | <p>Recent spills within the North Pile footprint warrant an update of the Ore Storage, Waste Rock, Processed Kimberlite Management Plan or a new North Pile Management Plan.</p> <p>Recommendation:</p> <p>Specify a due date for the submission of the North Pile Management Plan</p> | <p>In light of the submission date for the North Pile risk assessment, De Beers suggests that an update to the North Pile Management Plan be submitted by January 31, 2013. This is consistent with the submission date for the ARD and Geochemical Characterization</p> | <p>Since the last North Pile Management Plan was approved on February 5, 2010 (see Item 7), Item 8 therefore requires the next update to be submitted no later than February 5, 2013. As pointed out by De Beers, this will allow incorporation of information from the</p> | |

DFO Comments – Blue
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 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| | | Plan. | North Pile Risk Assessment. Board Decision: Retain draft WL language. | |
| 9. The results of monitoring conducted under the approved North Pile Management Plan in a calendar year shall be reported in the Annual Water Licence Report as per Part B, Item 7 and Schedule 1, Item 1.r. | | | New condition to clarify where and when to find results of North Pile monitoring | 9. The results of monitoring conducted under the approved <i>North Pile Management Plan</i> in a calendar year shall be reported in the <i>Annual Water Licence Report</i> as per Part B, Item 7 and Schedule 1, Item 1.r. |
| 10. The Licensee shall perform a risk assessment of the North Pile Facility to evaluate the adequacy of current operational procedures and monitoring efforts to ensure that impacts to the Receiving Environment are prevented or minimized. Results of the risk assessment shall be submitted to the Board by September 15, 2012 accompanied by recommendations for changes to the management of the North Pile Facility and a schedule of implementation. | <p>Risk assessments for the North Pile facility should be based on actual monitored conditions within the perimeter dikes and within the various cells. If this data does not exist, conservative parameters must be used in the risk assessment process.</p> <p>Recommendation:</p> <p>Including this sentence to the clause, "Risk Assessments shall be based on actual conditions and parameters, or conservative parameters if data is not available."</p> | <p>This requirement accurately reflects the discussion at the Hearing based on the evidence presented by De Beers and the interveners.</p> <p>De Beers does not agree with the recommendation to add a sentence regarding conservatism, as risk assessments are conservative by nature.</p> | <p>New condition reflecting reviewer concerns; see discussion in Part E of the Reasons for Decision.</p> <p>As pointed out by De Beers, there is no evidence on the record regarding the exact conditions under which the risk assessment should be conducted. Recommendations stemming from the risk assessment will be put into practice in an update to the North Pile Management Plan which is for Board approval; the risk assessment will have to be of adequate quality to support such recommendations.</p> <p>Board Decision: Retain draft WL language.</p> | 10. The Licensee shall perform a risk assessment of the North Pile Facility to evaluate the adequacy of current operational procedures and monitoring efforts to ensure that impacts to the Receiving Environment are prevented or minimized. Results of the risk assessment shall be submitted to the Board by September 15, 2012 accompanied by recommendations for changes to the management of the North Pile Facility and a schedule of implementation. |
| | It appears that this condition asks De Beers to perform a risk assessment and proposed | De Beers does not agree with this recommendation. The description | See above. | |

DFO Comments – Blue
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| | <p>solutions to deal with potential deposits of waste. But I don't see where the standards for this risk assessment are, or the method of establishing these standards is. This section should determine what steps/information needs to be in place to address potential adverse impacts from the use of water and the deposit of waste.</p> <p>Recommendation:</p> <p>To be enforceable, this section needs to specify what the Risk Assessment De Beers is responsible for handing in will include (as a minimum) so that the Inspector (and other) can review the proposed solutions,</p> | <p>of the risk assessment is adequate and reflects the discussions had during the Hearing.</p> | | |
| <p>11. The Licensee shall submit to the Board, for approval, an update of the Acid Rock Drainage (ARD) and Geochemical Characterization Plan by January 31, 2013. The plan shall describe how the Licensee shall assess and manage potential acid/alkaline rock drainage and metal leaching at the Snap Lake mine site during the construction and operation phases. The plan shall satisfy the requirements of Schedule 4, Item 3 and be in accordance with current best practices such as the <i>2009 MEND (Mine Environment Neutral Drainage) Report 1.20.1 Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials</i> – or subsequent updates, and current iterations of the <i>INAP (International Network for Acid Prevention) GARD (Global Acid Rock Drainage) Guide</i>.</p> | <p>The previous license required annual reporting. I believe the Plan cited will not change that reporting frequency (it shouldn't).</p> | <p>De Beers notes that s. 14 below requires annual monitoring.</p> | <p>Update of Part E, Item 7 of MV2001L2-0002. This plan was formerly an appendix to the North Pile Management Plan and, although the plans are linked, there may be circumstances in which one plan needs updating but not the other; therefore, this is now a separate requirement. The reference to a best practices guidance document has been updated and details of plan content have been moved to a schedule. The requirement for reporting the monitoring annual is stipulated in Item 14 below.</p> <p>Board Decision: Retain draft WL language.</p> | <p>11. The Licensee shall submit to the Board, for approval, an update of the <i>Acid Rock Drainage (ARD) and Geochemical Characterization Plan</i> by January 31, 2013. The plan shall describe how the Licensee shall assess and manage potential acid/alkaline rock drainage and metal leaching at the Snap Lake mine site during the construction and operation phases. The plan shall satisfy the requirements of Schedule 4, Item 3 and be in accordance with current best practices such as the <i>2009 MEND (Mine Environment Neutral Drainage) Report 1.20.1 Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials</i> – or subsequent updates, and current iterations of</p> |

DFO Comments – Blue
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| | | | | the <i>INAP (International Network for Acid Prevention) GARD (Global Acid Rock Drainage) Guide</i> . |
| <p>12. The Licensee shall submit to the Board, for approval, updates of the Acid Rock Drainage and Geochemical Characterization Plan at the following times:</p> <p>a) If the Licensee seeks changes to the plan;</p> <p>b) Every three (3) years following approval of the plan; or</p> <p>c) Upon the request of the Board.</p> | | | <p>New condition to clarify when plan updates are required.</p> | <p>12. The Licensee shall submit to the Board, for approval, updates of the Acid Rock Drainage and Geochemical Characterization Plan at the following times:</p> <p>a. If the Licensee seeks changes to the plan;</p> <p>b. Every three (3) years following approval of the plan; or</p> <p>Upon the request of the Board.</p> |
| <p>13. The Licensee shall conduct seepage surveys of all Waste storage areas, including the constructed kimberlite ore stockpile, the North Pile Facility and the Water Management Ponds in accordance with Schedule 4, Item 4. Results of the seepage surveys shall be assessed in the context of design predictions and in conjunction with monitoring results for the thermal and hydrological performance of the surveyed areas.</p> | <p>This condition seems to be missing the crucial last step of turning the results of seepage surveys into an Action Level that will prompt a response when seepage exceeds a certain threshold (e.g. quality, quantity, etc). Response may be re-evaluation of facility design or perimeter collection systems and locations.</p> <p>Recommendation:</p> <p>This clause should be modified to provide linkage to an Adaptive Management (Management Response) principle.</p> | <p>De Beers does not agree with this recommendation, as the North Pile Management Plan and the Water Management Plan already require adaptive management measures related to seepage. See also section 4(c) of Schedule 4.</p> | <p>Update of Part E Item 9 of MV2001L2-0002; details of surveys now in a schedule. Note that the requirement previously listed as Part B, Item 5.k) is now captured in the current Part E, Item 13.</p> <p>The seepage survey results are used for monitoring aspects of performance of both the North Pile Facility as well as the Water Management facilities. As pointed out by De Beers, the relevant management plans already have adaptive management requirements.</p> <p>Board Decision: Retain draft WL language.</p> | <p>13. The Licensee shall conduct seepage surveys of all Waste storage areas, including the constructed kimberlite ore stockpile, the North Pile Facility and the Water Management Ponds in accordance with Schedule 4, Item 4. Results of the seepage surveys shall be assessed in the context of design predictions and in conjunction with monitoring results for the thermal and hydrological performance of the surveyed areas.</p> |

DFO Comments – Blue
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| | <p>Where is the condition to turn results of the seepage surveys into action levels that will prompt a response when seepage exceeds a certain threshold (set by the Board, not De Beers)?</p> <p>Recommendation:</p> <p>Add action levels and required action/response(s) (quantifiable) which are established by the MVLWB.</p> | Please see above. | See above. | |
| <p>14. The results of monitoring conducted in a calendar year under the approved ARD and Geochemical Characterization Plan shall be submitted to the Board by March 31 each year. The ARD and Geochemical Characterization Monitoring Report shall contain the results of the seepage surveys required under Part E, Item 13 of this Licence.</p> | <p>The report submission date must occur after the calendar year in which the monitoring was done.</p> <p>Recommendation:</p> <p>Change to, "... submitted to the Board by March 31 of the year following the calendar year in which the data was collected."</p> | <p>De Beers agrees that the report submission contains the results of monitoring conducted in the preceding calendar year. However, De Beers doesn't believe that a clarification is necessary, as this is consistent with the manner in which other annual reporting requirements are addressed.</p> | <p>This is a new condition to clarify reporting requirements for this monitoring data.</p> <p>Board Decision: Change language of condition as recommended by AANDC.</p> | <p>14. The results of monitoring conducted in a calendar year under the approved <i>ARD and Geochemical Characterization Plan</i> shall be submitted to the Board by March 31 of the year following the calendar year in which the data was collected. The <i>ARD and Geochemical Characterization Monitoring Report</i> shall contain the results of the seepage surveys required under Part E, Item 13 of this Licence.</p> |
| | <p>To be legally sound, the wording should say "<i>submitted to the Board by March 31 of the year following the calendar year reported</i>" or similar.</p> <p>Recommendation:</p> <p>Add "<i>submitted to the Board by March 31 of the year following the calendar year reported</i>" or similar.</p> | Please see above. | See above. | |
| <p>15. If not approved by the Board, the plans in Part E, Items 1, 8, and 11 shall be revised and resubmitted in accordance with directives from</p> | | | <p>Update to Part E, Item 6 of MV2001L2-0002; consistent</p> | <p>15. If not approved by the Board, the plans in Part E, Items 1, 8, and 11 shall be revised and</p> |

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| the Board. | | | with other water licences | resubmitted in accordance with directives from the Board. |
| 16. The Licensee shall operate in accordance with the plans referred to Part E, Items 1, 8, and 11 as and when approved by the Board. | | | New condition added for consistency with other water licences. | 16.The Licensee shall operate in accordance with the plans referred to Part E, Items 1, 8, and 11 as and when approved by the Board. |
| PART F: CONDITIONS APPLYING TO WATER AND WASTEWATER MANAGEMENT | | | | |
| <p>Board Staff notes of clarification to reviewers:</p> <ul style="list-style-type: none"> We have proposed deleting the requirement for a Groundwater Quantity and Quality Monitoring Program as the information contained in that plan already discussed and/or reported elsewhere (i.e., the Water Management Plan, the ARD and Geochemistry Characterization Plan, and the Annual Water Licence Report) EQC values will be provided in the final licence Specific requirements for the Water Management Plan have been placed in Schedule 5 other proposed changes to conditions are based on recommendations or to be consistent with other Type A water licences | <p>In the existing licence, article 19 stated “the licensee will re-evaluate the Best Available Technology for treatment of the effluent discharged to Snap Lake and submit their findings to the Board as part of their application for any subsequent water licences ...”. However, a re-evaluation was not prepared by DeBeers as part of its water licence renewal package. This is a requirement of the existing water licence and must be completed. If not, this clause must be placed in the renewed water licence and that this re-evaluation occur as soon as reasonably possible (e.g. 30 or 60 days).</p> <p>AANDC understands that DeBeers may be looking into this as part of the water management issue at the site. Therefore AANDC sees no reason to exclude this clause.</p> <p>Recommendation: AANDC recommends that Board reinstate Part F, Item 19 from the previous water licence.</p> | <p>Please see De Beers' comment above relating to Best Available Technology.</p> <p>De Beers disagrees with the assertion that it has not complied with the previous Licence's requirement relating to Best Available Technology (BAT). A review of available BAT focused on TDS was conducted in 2008 by Golder Associates Ltd; since then, De Beers has requested that Golder Associates Ltd maintain a watching brief for new technology that could change the findings of that report regarding economic feasibility. Such technology has yet to appear.</p> | <p>This was addressed at the beginning of Part E above.</p> | |
| | EC supports DFO's comment that " the | Please see De Beers' comment | See above. | |

DFO Comments – Blue
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| | <p><i>Licensee shall re-evaluate the Best Available Technology for treatment of the effluent discharged to Snap Lake and submit their findings to the Board as part of their application for any subsequent WL's for the Snap Lake Diamond Project." It appears that this condition has been removed".</i></p> <p>Recommendation: <i>EC supports DFO's recommends that "the requirement for the re-evaluation of Best Available Technologies for the treatment of the effluent discharged to Snap Lake be maintained and that this condition should be altered to require DBCI to demonstrate how BATs are re-evaluated on a frequency that is acceptable to the MVLWB".</i></p> | <p>above relating to Best Available Technology.</p> | | |
| | <p>Chronic Toxicity – This had been a recurring test failure at the site, but it had elicited no response from the company and could not be explained. YKDFN did not accept the position that because the repeated failures could not be explained through analysis of the available data, there was no worry. Rather, YKDFN advocated that this required additional testing effort to better understand what phenomenon was occurring. There is no reference to this in the draft licence.</p> | <p>De Beers notes that there have not been "recurring test failures". Rather, there have been episodic instances of chronic toxicity observed in some laboratory tests but not in others. This subject was discussed at length during the Hearing process. De Beers reiterates the commitment made that the chemical and toxicological data, which are shared with interested parties, will continue to be closely examined and, where appropriate and possible, additional testing effort will be conducted. No changes to the Licence are required.</p> <p>At the Hearing De Beers committed to additional chronic testing, specifically an early life stage toxicity test with the</p> | <p>It was an oversight not to include an additional chronic toxicity test in the draft WL. There were specific recommendations to include an early life stage toxicity test for rainbow trout from both EC and AANDC in their interventions. It was also discussed at some length during the public hearing. The discussion over the specific type of testing can be found in the SNP section of the Reasons for Decision.</p> <p>Board Decision: Include a requirement sampling and analysis of samples from SNP station 02-20 for an early life stage (egg/alevin/fry) toxicity test</p> | |

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| | | rainbow trout <i>Oncorhynchus mykiss</i> embryo test on a once yearly basis in accordance with Method EPS/1/RM/28. | with the rainbow trout <i>Oncorhynchus mykiss</i> on a once yearly basis in accordance with Environment Canada Method EPS/1/RM/28. | |
| 1. The total quantity of fresh Water drawn from Snap Lake and used by the Snap Lake Diamond Project shall not exceed one hundred and eighty-eight thousand (188,000) cubic metres annually. | I believe it's technically no longer called a "project"; it's legally now a "mine". But I could be wrong. Recommendation: Change "project" to "mine". | This issue was discussed during the Hearing process and it is De Beers' understanding that the term "Project", as opposed to "Mine", will continue to be used. | Condition unchanged from MV2001L2-0002 | 1. The total quantity of fresh Water drawn from Snap Lake and used by the Snap Lake Diamond Project shall not exceed one hundred and eighty-eight thousand (188,000) cubic metres annually. |
| 2. The Licensee shall install meters for all structures used to withdraw Water or Discharge waters or Waste to the satisfaction of an Inspector. | | De Beers recommends that this provision be re-worded as follows: "The Licensee shall install meters as <i>required</i> for all structures used to withdraw water or Discharge waters or Waste to the satisfaction of an Inspector". Meters may not be feasible, practical, or necessary for all such structures. | Condition unchanged from MV2001L2-0002 | 2. The Licensee shall install meters for all structures used to withdraw Water or Discharge Waters or Waste to the satisfaction of an Inspector. |
| 3. The Licensee shall construct and maintain the Water intake in accordance with the Department of Fisheries and Ocean's (DFO's) requirements to prevent entrainment of fish. Dimensions should follow DFO's <i>Freshwater Intake End-of-Pipe Fish Screen Guidelines</i> . | | | Condition unchanged from MV2001L2-0002 | 3. The Licensee shall construct and maintain the Water intake in accordance with the Department of Fisheries and Ocean's (DFO's) requirements to prevent entrainment of fish. Dimensions should follow DFO's <i>Freshwater Intake End-of-Pipe Fish Screen Guidelines</i> . |

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| <p>4. The Licensee shall manage Water and Wastewater with the objective of minimizing the impacts of the Project on the quantity and quality of Water in the Receiving Environment through the use of appropriate mitigation measures, monitoring, and follow-up actions.</p> | | | <p>New condition, see discussion in Part F of Reasons for Decision</p> | <p>4. The Licensee shall manage Water and Wastewater with the objective of minimizing the impacts of the Project on the quantity and quality of Water in the Receiving Environment through the use of appropriate mitigation measures, monitoring, and follow-up actions.</p> |
| <p>5. The Licensee shall submit to the Board for approval an update of the Water Management Plan on October 1, 2013 and at the following times:</p> <ul style="list-style-type: none"> a) If the Licensee seeks changes to the plan; b) Every three (3) years following approval of the plan; or c) Upon the request of the Board. <p>Updates to the Water Management Plan shall describe how the Licensee is meeting the objectives listed in Part F, Item 4 of this Licence and satisfy the requirements of Schedule 5, Item 1.</p> | | | <p>Update to condition Part F, Item 4 of MV2001L2-0002; details of plan content have been moved to a schedule and the timing of updates has been further clarified.</p> | <p>5. The Licensee shall submit to the Board for approval an update of the Water Management Plan on October 1, 2013 and at the following times:</p> <ul style="list-style-type: none"> a. If the Licensee seeks changes to the plan; b. Every three (3) years following approval of the plan; or c. Upon the request of the Board. <p>Updates to the Water Management Plan shall describe how the Licensee is meeting the objectives listed in Part F, Item 4 of this Licence and satisfy the requirements of Schedule 5, Item 1.</p> |
| <p>6. The Licensee shall operate in accordance with the plan referred to Part F, Item 5 as and when approved by the Board.</p> | | | <p>New condition for consistency with other water licences</p> | <p>6. The Licensee shall operate in accordance with the plan referred to Part F, Item 5 as and when approved by the Board.</p> |
| <p>7. The results of any monitoring performed in a calendar year under the approved Water Management Plan described shall be reported in the Annual Water Licence Report as per Part B,</p> | | | <p>This is a new condition to clarify reporting requirements for this monitoring data</p> | <p>7. The results of any monitoring performed in a calendar year under the approved Water Management Plan described shall be reported</p> |

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| Item 7 and Schedule 1, Item 1.s. | | | | | in the Annual Water Licence Report as per Part B, Item 7 and Schedule 1, Item 1.s. |
| 8. Effluent from the Sewage Treatment Plant shall be tested prior to mixing with the effluent from the Water Treatment Plant at Surveillance Network Program Station Number 02-16 and will meet the following effluent quality requirements: | | <i>It is inconsistency to use SNP 02-16 here and use SNP 02-16i in the Surveillance Network Program (SNP) Recommendation: Use SNP 02-16i for consistency</i> | De Beers agrees with this recommendation. The Average Monthly Limit for Faecal Coliforms should be 10 CFU/100mL. | Update to Part F, Item 15 of MV2001L2-0002; Board Decision: Change reference in WL to 02-16i | 8. Effluent from the Sewage Treatment Plant shall be tested prior to mixing with the effluent from the Water Treatment Plant at Surveillance Network Program Station Number 02-16i and will meet the following effluent quality requirements: Note – please refer to the wl for the table |
| Parameter | Maximum Concentration of any Grab Sample (mg/L) | | | | |
| BOD ₅ | 25 | | | | |
| Oil and Grease | 5.0 | | | | |
| Faecal Coliforms | 20 CFU/100mL | | | | |
| 9. Effluent quality criteria requirements: a) All water or Waste from the Project that enters the Receiving Environment, including all Discharges from Surveillance Network Program Station 02-17b, shall meet the following effluent quality criteria: | | AANDC notes that the previous water licence includes a loading limit for ammonia (187,000 kg/yr) and nitrate (219,000 kg/yr). However, an omission from the original water licence was an annual load limit for TDS. The Report of EA from the MVEIRB specifically states the following as part of the first Recommendation for the project: “ The Board anticipates that regulatory terms and conditions will be prepared that will include the requirement to verify EA predictions of mine groundwater discharge quality. In order to ensure that significant adverse impacts on aquatic life do not occur, and to ensure implementation of the commitments made by DeBeers during the EA process, the Board recommends that the following measures be implemented through the Production Water Licence as a | See De Beers' comment above regarding the definition of "Receiving Environment". Regarding the recommendation for a TDS loading limit, this constitutes a substantive new issue that could have been raised and addressed at the Hearing. De Beers disagrees that an addition to the Licence of a loading limit for TDS is appropriate. Further, no evidence has been presented as to what such a limit would be. De Beers disagrees with the recommendation regarding maximum annual load. Average Annual Load is the appropriate measure for this parameter related to monitoring for potential | the effluent quality criteria (EQC) for this WL. Please see Part F of the Reasons for Decision and Appendix C for a full discussion of how EQC were set for this WL. Condition 9c) was previously Part F, Item 16. Condition 9d) was previously Part F, Item 21. As pointed out by De Beers, there was no specific evidence provided during this | 9. Effluent quality criteria requirements: a. All Water or Waste from the Project that enters the Receiving Environment, including all Discharges from Surveillance Network Program Station 02-17b (permanent Water treatment plant) and 02-17 (temporary Water treatment plant), shall meet the following effluent quality criteria: b. Any Water or Waste from the Project that enters the Receiving Environment shall have a pH between 6.0 and 9.0, except surface runoff which shall have a pH between 5.0 and 9.0. c. The monthly average limit for Extractable Petroleum Hydrocarbons shall be 4.6 mg/L for F1 (C6-C10) and 2.1 mg/L for F2 (C11- |
| Maximum Concentration of any Grab Sample (mg/L) | Average Monthly Limit (mg/L) | | | | |
| | | | | | |
| b) Any water or Waste from the Project that enters the Receiving Environment shall have a pH between 6.0 and 9.0, except surface runoff which shall have a pH between 5.0 and 9.0. c) The monthly average limit for Extractable Petroleum Hydrocarbons | | | | | |

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| <p>shall be 4.6 mg/l for F1 (C6-C10) and 2.1 mg/l for F2 (C11-C16) and the Discharge shall be managed to prevent the appearance of any visible film from the Discharge on the surface of Snap Lake in the vicinity of the outfall.</p> <p>d) The Licensee shall ensure that the effluent discharged to Snap Lake shall not be acutely toxic to aquatic life, using protocols described in the Surveillance Network Program annexed to this Licence.</p> | <p>means of implementing an 'annual loading limit' for the discharge of TDS to Snap Lake... (R1)...".</p> <p>In fact, the Report makes reference to a loading limit in Recommendations 1, 2, 5, 6, 7 & 10. The maximum loading limit DeBeers predicted in the EA was to occur during year 19. The annual TDS load for that year was 15,310 kg/day or 5,588,150 kg/yr (by year 8, which corresponds to 2012, it was assumed to be 10,129 kg/day). Recommendation: A loading limit for TDS must be placed in the water licence to address an outstanding requirement from the EA.</p> <p>Consider changing Average Annual Load to Maximum Annual Load (kg/yr). For TDS this loading limit may be tiered or scheduled (anticipated to increase to 15,310 kg/day in year 19 from 10,129 kg/day in year 8).</p> <p>Add Total Phosphorus to the table as a Maximum Annual Load (256 kg/yr).</p> | <p>adverse effects to the ecological function of Snap Lake.</p> <p>As the EQCs are not included in this draft Licence, De Beers cannot comment on them.</p> <p>For clarity, De Beers suggests that section 9(d) be re-worded as follows:</p> <p>"The Licensee shall ensure that the effluent discharged to Snap Lake shall not be acutely toxic to aquatic life, in accordance with Environment Canada's Environmental Protection Series Biological Test Method <i>EPS/1/RM/13</i> (acute lethality to rainbow trout <i>Oncorhynchus mykiss</i>)".</p> | <p>renewal process about whether a loading limit for TDS was appropriate and, if so, what that limit should be. As the record is closed, the Board cannot accept new evidence at this stage.</p> <p>The load limit for phosphorus is in Part F, Item 11; there is no rationale to change it.</p> <p>De Beers has recommended specifying what acute lethality test (i.e., rainbow trout test) the effluent must pass; however, the SNP contains two lethality tests currently, one for rainbow trout and one for <i>Daphnia magna</i>. Therefore, De Beers' suggestion would, in effect,</p> | <p>C16) and the Discharge shall be managed to prevent the appearance of any visible film from the Discharge on the surface of Snap Lake in the vicinity of the outfall.</p> <p>d. The Licensee shall ensure that the effluent discharged to Snap Lake shall not be acutely toxic to aquatic life, using protocols described in the Surveillance Network Program annexed to this Licence.</p> |
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DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| | | | <p>reduce the number of criteria that the effluent must meet. There is no evidence to support this change.</p> <p>Board Decision: -Do not add a loading limit for TDS to the EQC requirements. -Do not change the location of the phosphorus loading limit -Do not change the current requirements for passing acute lethality testing</p> | |
| | <p>Both SNP 02-17b and SNP 02-17 are used in the SNP monthly reports.</p> <ul style="list-style-type: none"> • SNP 02-17 for Temporary Water Treatment Plant (WTP) effluent • SNP 02-17b for Permanent WTP effluent <p>It is inconsistency to use SNP 02-17b here and SNP 02-17 in Item 10 and Surveillance Network Program</p> <p>The unit should be mg/L (reference to 9(c)). Recommendation:</p> | <p>De Beers agrees with these recommendations.</p> | <p>Board Decision: Make both of the changes that SLEMA has recommended.</p> | |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
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 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| | <p>Use both 02-17b and SNP 02-17 in related terms and/or conditions The parameters and related values for EQCs should be specified</p> <p>Change mg/l to mg/L (reference to 9 (c))</p> | | | |
| | <p>Much better wording than in the previous W.L.</p> <p>This should note discharge from BOTH of the current WTP's (i.e., including the temporary w.t.p.), thus it should include 02-17 and 02-17b).</p> <p>I note that the proposed parameter limits were not included. Reviewers need to have an opportunity to review the actual values in a draft form before a final licence is approved by the Board.</p> <p>EQC's need to be explicitly linked with action levels to be clearly enforceable.</p> <p>Recommendation:</p> <p>Add "02-17".</p> <p>Release a second draft W.L. for review that includes actually EQC values in this table.</p> <p>Link EQC's with action levels.</p> | <p>Please see above. De Beers notes that Action Levels will be developed in the AEMP Design Plan.</p> | <p>In regards to the name of the SNP station, see response to SLEMA comment above.</p> <p>In regards to the EQC's not being included in the draft WL, the reviewers and proponent both had opportunities to provide their evidence through the renewal process and the record is now closed. The Board has considered the evidence on the record and has made its decisions accordingly.</p> <p>Action Levels will be set later this year in the AEMP re-design process and all parties will have an opportunity to comment at that time.</p> | |
| <p>10. The pH of the final effluent discharged to Snap lake at SNP station 02-17 shall be managed as necessary by the Licensee to prevent acute toxicity of ammonia in the final effluent</p> | | | <p>Previously condition Part F, Item 18 in MV2001L2-0002.</p> | <p>10. The pH of the final effluent discharged to Snap lake at SNP station 02-17 shall be managed as necessary by the Licensee to</p> |

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 AANDC Inspector's Comments – Black
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| <p>discharged. Adjustment of the pH shall be made only when necessary to prevent acute ammonia toxicity and shall not result in a pH in the final effluent below the ambient pH of Snap lake at any time</p> | | | | <p>prevent acute toxicity of ammonia in the final effluent discharged. Adjustment of the pH shall be made only when necessary to prevent acute ammonia toxicity and shall not result in a pH in the final effluent below the ambient pH of Snap lake at any time</p> |
| <p>11. Total phosphorus loads from the Water and Sewage Treatment Plants discharging to Snap Lake must be controlled, as per approved operations plans, such that loads of total phosphorus do not exceed an annual loading of 256 kg per year in any calendar year during the life of the Project.</p> | <p>This should be added to clause 9 (above). This way the loading limit will not be overlooked.</p> <p>Recommendation: See clause 9 recommendation.</p> | <p>The loading limit for total phosphorus will not be overlooked. This change is not necessary.</p> | <p>Previously condition Part F, Item 10 in MV2001L2-0002.</p> <p>Board Decision: Retain draft WL language.</p> | <p>11. Total phosphorus loads from the Water and Sewage Treatment Plants discharging to Snap Lake must be controlled, as per approved operations plans, such that loads of total phosphorus do not exceed an annual loading of 256 (two hundred and fifty-six) kg per year in any calendar year during the life of the Project.</p> |
| <p>12. The Licensee shall direct all Water or Waste from the Project that does not meet the effluent quality criteria specified under Part F, Item 9.a to the Water Treatment Plant or Water Management Pond.</p> | | <p>De Beers recommends that this provision be modified to include the provision in the previous Licence which allows for the Inspector to authorize the divergence of water to an alternate location if necessary. Such a provision is a prudent contingency measure. De Beers recommends that s. 12 be re-worded as follows:</p> <p>“The Licensee shall direct all water or Waste from the Project that does not meet the effluent quality criteria specified under Part F, Item 9.a to the Water Treatment Plant or Water</p> | <p>The additional wording suggested by De Beers was actually in WL MV2001L2-0002 and it appears to have been inadvertently omitted in the draft WL. The reference to 9.a may be inappropriate as there are additional EQC in 9b-d.</p> <p>Board Decision: Use language from MV2001L2-0002: “The Licensee shall direct all Water or Waste from the Project that does not meet the effluent quality criteria specified under Part F, Item 9 to the Water Treatment Plant or Water</p> | <p>12. The Licensee shall direct all Water or Waste from the Project that does not meet the effluent quality criteria specified under Part F, Item 9 to the Water Treatment Plant or Water Management Pond. The Inspector may authorize the divergence of Water to an alternate location if necessary. The Licensee shall notify the Board in writing within twenty-four (24) hours of this authorization being granted.</p> |

DFO Comments – Blue
 ENR Comment – Green
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 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| | | Management Pond. The Inspector may authorize the divergence of water to an alternate location if necessary. The Licensee shall notify the Board in writing within twenty-four (24) hours of this authorization being granted.” | Management Pond. The Inspector may authorize the divergence of water to an alternate location if necessary. The Licensee shall notify the Board in writing within twenty-four (24) hours of this authorization being granted.” | |
| 13. The calculated whole lake average of TDS, (as described in the Surveillance Network Program) at sampling locations comprising Surveillance Network Program Station Number 02-18 shall remain below 350 mg/L at all times. | <p>Is it necessary to have a term about Water Quality Objectives for the consistency with Schedule 5, Item 2, 3, and 4?</p> <p>Recommendation:</p> <p>Add a term about Water Quality Objectives</p> | Although the whole lake average of TDS is more appropriately thought of as a Water Quality Objective, as opposed to an Effluent Quality Criterion, not all Water Quality Objectives will necessarily be expressed in terms of whole lake average. De Beers therefore recommends that no changes be made to this provision. | <p>Previously condition Part F, Item 11 of MV2001L2-0002.</p> <p>Board Decision: Retain draft WL language.</p> | 13. The calculated whole lake average of TDS, (as described in the Surveillance Network Program) at sampling locations comprising Surveillance Network Program Station Number 02-18 shall remain below 350 mg/L at all times. |
| 14. The Licensee shall submit to the Board for approval a plume characterization study to assess the performance of the outfall diffuser installed in 2011 and the distribution of the diffuser plume in Snap Lake under a variety of conditions (including under ice in late winter). | <p>Under Part E, Item 14 it seems as though no deadline has been specified for the plume characterization study.</p> <p>Recommendation:</p> <p>EC recommends that Part E, item 14 states, "...submit to the Board for approval by XXXX a plume characterization study...".</p> | De Beers is not opposed to a deadline being specified for submission of this study. De Beers recommends that January 31, 2013 be utilized, given that the field work necessary for the study will have to take place in the summer and the data will then have to be analyzed and reported. | Board Decision: Accept De Beers' recommendation of a due date. | 14. The Licensee shall submit to the Board for approval a plume characterization study to assess the performance of the outfall diffuser installed in 2011 and the distribution of the diffuser plume in Snap Lake under a variety of conditions (including under ice in late winter) by January 31, 2013. |
| | <p>What is the due date for report submission</p> <p>Recommendation:</p> | Please see above. | Please see above. | |

DFO Comments – Blue
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| | Specify a due date | | | |
| | <p>What is the due date for the report submission? These dates should be clarified and submitted to interested parties for review & comment before a final WL is approved by the Board.</p> <p>Recommendation: Specify a date (preferably before ice off, but <i>not</i> on March 31st).</p> | Please see above. | Please see above. | |
| <p>15. The Licensee shall submit for approval by XXXX, 20XX a Strontium Response Plan that satisfies the requirements of Schedule 5, Item 2.</p> | <p>AANDC suggests that one calendar year from the date of water licence issuance should be granted for this plan submission.</p> <p>Recommendation: AANDC suggests the dates be June 15, 2013</p> | <p>De Beers recommends a submission date for the Strontium, TDS, and Nitrogen Response Plans of December 31, 2013. This is consistent with the position taken by De Beers during the Hearing, given the biological considerations inherent in this testing (e.g., timing of fish reproduction and duration of testing).</p> <p>De Beers recommends that the Strontium, TDS, and Nitrogen Response Plans be re-named the Strontium, TDS, and Nitrogen "Management Plans" for clarity, given that their content is not entirely consistent with the definition of "Response Plan".</p> | <p>Board Decision: Accept the December 31 2013 date based on De Beers explanation.</p> <p>These plans focus on specific parameters of concern, not larger mine infrastructure such as the NP Management Plan, Waste Management Plan, etc. The Response Plans describe how these specific parameters will be monitored, mitigated and if necessary a process for determining a WQO.</p> <p>Board Decision: In order to clearly differentiate the different types of Plans Board staff recommend retaining the title "Response Plans"</p> | <p>15.The Licensee shall submit for approval by December 31, 2013 a <i>Strontium Response Plan</i> that satisfies the requirements of Schedule 5, Item 2.</p> |
| | <p>What is the due date for report submission Recommendation:</p> | Please see above. | | |

DFO Comments – Blue
 ENR Comment – Green
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 AANDC Inspector's Comments – Black
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| | Specify a due date | | | |
| | <p>What is the due date for the report submission? These dates should be clarified and submitted to interested parties for review & comment before a final WL is approved by the Board.</p> <p>Recommendation:</p> <p>Specify a date (preferably before ice off, but <i>not</i> on March 31st).</p> | Please see above. | Please see above | |
| 16. The Licensee shall submit for approval by XXXX, 20XX a TDS Response Plan that satisfies the requirements of Schedule 5, Item 3. | <p>AANDC suggests that one calendar year for the date of water licence issuance should be granted for this plan submission.</p> <p>Recommendation:</p> <p>AANDC suggests the dates be June 15, 2013</p> | Please see above. | Please see above | 16.The Licensee shall submit for approval by December 31, 2013 a <i>TDS Response Plan</i> that satisfies the requirements of Schedule 5, Item 3. |
| | <p>What is the due date for report submission.</p> <p>Recommendation:</p> <p>Specify a due date</p> | Please see above. | | |
| | <p>What is the due date for the report submission? These dates should be clarified and submitted to interested parties for review & comment before a final WL is approved by the Board.</p> <p>Recommendation:</p> <p>Specify a date (preferably before ice off, but <i>not</i> on March 31st).</p> | Please see above. | | |
| 17. The Licensee shall submit for approval by XXXX, 20X a Nitrogen Response Plan that satisfies the requirements of Schedule 5, Item 4. | <p>AANDC suggests that one calendar year for the date of water licence issuance should be granted for this plan submission.</p> <p>Recommendation:</p> | Please see above. | | 17.The Licensee shall submit for approval by December 31, 2013 a <i>Nitrogen Response Plan</i> that satisfies the requirements of Schedule 5, Item 4. |

DFO Comments – Blue
 ENR Comment – Green
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 AANDC Inspector's Comments – Black
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| | AANDC suggests the dates be June 15, 2013 | | | |
| | <p>What is the due date for report submission</p> <p>Recommendation:</p> <p>Specify a due date</p> | Please see above. | | |
| | <p>What is the due date for the report submission? These dates should be clarified and submitted to interested parties for review & comment before a final WL is approved by the Board.</p> <p>Recommendation:</p> <p>Specify a date (preferably before ice off, but <i>not</i> on March 31st).</p> | Please see above. | | |
| 18. If not approved by the Board, the plans referred to in Part F, Items 5, 15, 16, and 17 shall be revised and resubmitted in accordance with directives from the Board. | | | New condition for consistency with other water licences | 18.If not approved by the Board, the plans referred to in Part F, Items 5, 15, 16, and 17 shall be revised and resubmitted in accordance with directives from the Board. |
| 19. The Licensee shall implement the plans referred to in Part F, Items 15, 16, and 17 as and when approved by the Board. | <p>I don't see why the old WL condition 19 was removed (re-evaluate Best Available Technology for treatment of effluent & submit findings to the Board as part of subsequent WL applications. Principles of environmental stewardship would seem to require such sort of re-evaluation at that time.</p> <p>Recommendation:</p> <p>Reinstate the old condition 19. <i>"The</i></p> | Please see De Beers' comment above relating to Best Available Technology. | See discussion above, at the beginning to Part E, about the inclusion of this condition. | 19.The Licensee shall implement the plans referred to in Part F, Items 15, 16, and 17 as and when approved by the Board. |

DFO Comments – Blue
 ENR Comment – Green
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 AANDC Inspector's Comments – Black
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| | <i>Licensee will re-evaluate the Best Available Technology for treatment of the effluent discharged to Snap Lake and submit their findings to the Board as part of their application for any subsequent Water Licences for the Snap Lake Mine”.</i> | | | |
| | | | | 20. The Licensee will re-evaluate the Best Available Technology for treatment of the effluent discharged to Snap Lake and submit their findings at the request of the Board |
| PART G: CONDITIONS APPLYING TO THE AQUATIC EFFECTS MONITORING | | | | |
| <p>Board Staff notes of clarification to reviewers:</p> <ul style="list-style-type: none"> • Specific requirements for the Aquatic Effects Monitoring Program (AEMP), the AEMP Design Plan and the Re-Evaluation Report have been placed in Schedule 6. • other proposed changes to conditions are based on recommendations or to be consistent with other Type A water licences | <p>The AEMP terms and conditions are well organized. The update structure of AEMP design plan and re-evaluation report for approval every 4 years is justifiable, but logically the re-evaluation is ahead of re-design. The requirement of AEMP annual report for approval is an improvement.</p> <p>Recommendation:</p> <p>Put the AEMP re-evaluation first, before the AEMP design plan</p> | <p>The AEMP Design Plan and its subsequent updates will necessarily depend on and be connected to the content of the AEMP Re-Evaluation Report. For clarity, efficiency, and to ensure that these two reports are always submitted and approved at the same time, De Beers recommends that they be amalgamated into one Plan instead of two. The resulting single Plan could begin with the content currently proposed to be included in the Re-Evaluation Report and end with the content currently proposed to be included in the AEMP Design Plan.</p> | <p>It is very true that the AEMP Design Document and the Re-evaluation report are closely linked; however, having the AEMP Design Document separate from the Re-evaluation Report allows changes to be made to the design as needed during the four years between Re-evaluation reports. It also allows for reviewers to have a standalone document that describes the sampling and analysis plan for the AEMP.</p> <p>Board staff considered the alternative order of report listing in the AEMP section; however, if listing the requirement for an AEMP Design Report makes sense after the condition about the objectives of the AEMP program in Item 1.</p> | |

DFO Comments – Blue
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 AANDC Inspector's Comments – Black
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| | | | Board Decision: -Leave the Re-evaluation Report and the Design Document as separate reports. -Leave the order of the report listing as per the draft WL | |
| 1. The Aquatic Effects Monitoring Program (AEMP) shall meet the following objectives and satisfy the requirements in Schedule 6, Item 1: a. To determine the short- and long-term effects of the Project on the receiving environment; b. To test the predictions made in the Environmental Assessment or in other submissions to the Board regarding the impacts of the Project on the receiving environment; c. To assess the efficacy of mitigation measures that are used to minimize the effects of the Project on the Receiving Environment; and d. To identify the need for additional mitigation measures to reduce or eliminate Project-related effects. | <p>One of the main reasons for an AEMP is to allow detection of potential effects at an early warning level.</p> <p>Recommendation:</p> <p>The fourth bullet could be revised to state:</p> <p>To identify the need for additional mitigation measures at an early enough stage to reduce or eliminate Project-related effects before they become an impact.</p> | De Beers believes that this recommendation is not required, as it is already captured under 1(d). | This is a new condition based on consistency with other water licences; please see a discussion in Part G of the Reasons for Decision. Some requirements of the program that were previously listed in Part G, Item 2 of MV2001L2-0002 are now in a Schedule. Board Decision: Retain draft WL language. | 1. The Aquatic Effects Monitoring Program (AEMP) shall meet the following objectives and satisfy the requirements in Schedule 6, Item 1: a) To determine the short- and long-term effects of the Project on the receiving environment; b) To test the predictions made in the Environmental Assessment (EA) or in other submissions to the Board regarding the impacts of the Project on the receiving environment; c) To assess the efficacy of mitigation measures that are used to minimize the effects of the Project on the Receiving Environment; and d) To identify the need for additional mitigation measures to reduce or eliminate Project-related effects. |
| | It is not clear why testing Impact Predictions made in the EA cannot be a standalone objective. Impact predictions are necessary | De Beers believes that this recommendation is not required, as it is already clear that one of | The rationale for AANDC's suggestion is not clear. | |

DFO Comments – Blue
 ENR Comment – Green
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 AANDC Inspector's Comments – Black
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| | <p>in the EA to assess the effects of a project on the environment as well as assess the proposed mitigation options.</p> <p>Recommendation:</p> <p>Separate 1.b into two separate items, one in relation to the EA and the other in relation to other submissions.</p> | <p>the objectives of the AEMP is to test the predictions made in the Environmental Assessment.</p> | <p>Board Decision: Retain draft WL language</p> | |
| <p>2. The Licensee shall implement the Aquatic Effects Monitoring Program as approved under Licence MV2001L2-0002 unless otherwise directed by the Board.</p> | | | <p>New condition to ensure continuity in monitoring efforts.</p> | <p>2. The Licensee shall implement the Aquatic Effects Monitoring Program as approved under Licence MV2001L2-0002 unless otherwise directed by the Board.</p> |
| <p>3. The Licensee shall submit to the Board, for approval, an update to the Aquatic Effects Monitoring Program Design Plan on October 1, 2012 and every four (4) years thereafter. The updated AEMP Design Plan shall satisfy the requirements of Schedule 6, Item 2.</p> | <p>The Diavik Diamond Mine and BHP Billiton Ekati Diamond Mine both have a similar condition in their AEMPs; however, rather than every 4 years the update is required every 3 years.</p> <p>Recommendation:</p> <p>The Board should consider changing this condition to every 3 years to be consistent with the other operating diamond mines in the NWT.</p> | <p>De Beers is not opposed to the Licence requiring an update to the AEMP Design Plan and the AEMP Re-Evaluation Report (as a single plan as per the recommendation above) every 3 years, as opposed to every 4 years. However, if the Board is of the view that a 4 year cycle is more appropriate based on its experience with other mines, De Beers recommends maintaining the provisions as drafted.</p> | <p>Update of condition Part G, Item 1 of MV2001-L2-0002; requirements previously listed in Part G, Item 2 of MV2001L2-0002 are now in a Schedule.</p> <p>As noted by DFO, other diamond mines are required to update their AEMPs every three years but this is possible because they only take samples between April and September. However, De Beers samples in the environment from January to October. Therefore, if you want a re-designed AEMP to be based on at least three years of data collected on the old design (which is the case for the other mines), they</p> | <p>3. The Licensee shall submit to the Board, for approval, an update to the Aquatic Effects Monitoring Program Design Plan on October 1, 2012 and every four (4) years thereafter. The updated AEMP Design Plan shall satisfy the requirements of Schedule 6, Item 2.</p> |

DFO Comments – Blue
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| | | | <p>could only submit every 4th year. It means that the old AEMP design gets used 4 years in total but the only other way to do it was to have the new design based on only 2 years of data. Same goes for the Re-evaluation Report which we definitely want to be based on at least 3 years of data.</p> <p>Board Decision: Retain draft WL language.</p> | |
| | <p>Period of four years is inconsistent with other authorizations.</p> <p>Recommendation:</p> <p>Change the requirement to every 3 years to be consistent with other diamond mine water licences.</p> | Please see above. | Please see above. | |
| 4. The Licensee shall implement the updated AEMP Design Plan as and when approved by the Board. | | | Previously condition Part G, Item 5 of MV2001L2-0002 | 4. The Licensee shall implement the updated <i>AEMP Design Plan</i> as and when approved by the Board. |
| 5. The Licensee may at any time propose amendments to the AEMP Design Plan for approval by the Board. | | | New condition to give flexibility for potentially useful changes to the AEMP design over time. | 5. The Licensee may at any time propose amendments to the <i>AEMP Design Plan</i> for approval by the Board. |

DFO Comments – Blue
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 AANDC Inspector's Comments – Black
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| | | | Condition added to allow for the Design Plan to be updated and reviewed | 6. The Licensee shall review and modify the AEMP Design Plan as necessary to reflect directives from the Board. All modified plans shall be submitted to the Board for approval. |
| <p>6. The Licensee shall submit an Aquatic Effects Re-evaluation Report for Board approval by October 1, 2012 and every four (4) years thereafter that meets the following objectives and satisfies the requirements of Schedule 6, Item 3:</p> <p>a. To describe the project-related effects on the receiving environment as measured from project inception and compared against EA predictions;</p> <p>b. To update predictions of Project-related effects on the receiving environment based on monitoring results obtained since Project inception; and</p> <p>c. To propose, if necessary, updates to the AEMP design with supporting rationale including, but not limited to, the updated effect predictions.</p> | <p>As per the recommendation regarding the frequency of updates, the AEMP re-evaluation should be every three years to be consistent with the other diamond mines.</p> | Please see above. | <p>New condition – please see discussion in Part G of Reasons for Decision. Please see above (under Item 3) for a discussion of why 4 years instead of 3.</p> <p>Board Decision: Retain draft WL language.</p> | <p>7. The Licensee shall submit an <i>Aquatic Effects Re-evaluation Report</i> for Board approval by October 1, 2012 and every four (4) years thereafter that meets the following objectives and satisfies the requirements of Schedule 6, Item 3:</p> <p>a) To describe the project-related effects on the receiving environment as measured from project inception and compared against EA predictions;</p> <p>b) To update predictions of Project-related effects on the receiving environment based on monitoring results obtained since Project inception; and</p> <p>c) To propose, if necessary, updates to the AEMP design with supporting rationale including, but not limited to, the updated effect predictions.</p> |
| | <p>Period of four years is inconsistent with other authorizations.</p> <p>AANDC feels that there may be some confusion between the requirement in Item 3 and this requirement. The difference between the Design Plan and Re-evaluation Report should be provided (i.e. Reasons for Decision).</p> | Please see above. | Please see above. | |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
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| | <p>AANDC recalls the title of this report is different in other water licences which may provide better clarity on differences between the submissions to reviewers and the licensee.</p> <p>Recommendation:</p> <p>Change the requirement to every 3 years to be consistent with other diamond mine water licences.</p> | | | |
| <p>7. The Licensee shall submit to the Board on an annual basis by May 1 for approval an AEMP Annual Report that shall include information relating to data collected in the preceding calendar year and that satisfies the requirements of Schedule 6, Item 4.</p> | <p>AANDC notes that most if not all other licences require the Annual AEMP report to be submitted on March 31st. AANDC notes that moving the date to May 1st will cause confusion over submission dates between operations. Note that the submission is reporting on the previous year's data and analyses. Delaying the report deadline may mean identification of omissions, errors, action level exceedances and management response will be also delayed.</p> <p>The submission date issue will likely become more complicated when additional operators come online in the future.</p> <p>Recommendation:</p> <p>Consider changing the submission date back to March 31st.</p> | <p>De Beers notes that the issue of submission dates was discussed during the Hearing (in particular at the Technical Sessions) and concerns were expressed about the need to space reporting requirements so that they did not all occur at the same time, in order to provide some relief for reviewers and De Beers. Unless otherwise noted in De Beers' comments elsewhere, De Beers believes that the submission dates contained in this draft Licence are appropriately responsive to these concerns and should not be changed. In regards to the reporting of Action Level exceedances, please see De Beers' comment below.</p> | <p>Update of condition Part G, Item 7 of MV2001L2-0002; some requirements listed in Part G of MV2001L2-0002 are now in a Schedule.</p> <p>We note that all of the mines have trouble getting the AEMP Annual Reports in by March 31st usually because plankton data takes so long to get analyzed (typically plankton collected in late summer is not finished analysis until February of the following year). This coupled with the large number of other reports that come in on March 31 make the May 1 date more sensible.</p> <p>Board Decision: Retain draft WL language</p> | <p>8. The Licensee shall submit to the Board on an annual basis by May 1 for approval an AEMP Annual Report that shall include information relating to data collected in the preceding calendar year and that satisfies the requirements of Schedule 6, Item 4.</p> |
| <p>8. If any Action Level as defined in the approved AEMP Design Plan is exceeded, the Licensee shall submit to the Board for</p> | <p>The action plan/response plan should not take approximately 4 months to prepare and submit. This delay would mean that</p> | <p>De Beers is not opposed to reporting an exceedance of an Action Level within 30 days of</p> | <p>As stated by De Beers, it is very likely that the exceedance of some Action</p> | <p>9. If any Action Level as defined in the approved <i>AEMP Design Plan</i> is exceeded, the Licensee shall notify the Board within 30 days of when</p> |

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| <p>approval an AEMP Response Plan by September 1 of the year in which the exceedance is reported. The AEMP Response Plan shall satisfy the requirements of Schedule 6, Item 5.</p> | <p>the entire summer season would be lost to an adaptive management response action. Also, note the potential exceedance may be time sensitive (moderate to high action level).</p> <p>AANDC envisions that the problem parameters associated with action level exceedances would be well known prior to the exceedance, particularly for existing projects. It is likely that only a few parameters are likely to exceed action levels at these sites. As such, draft management response plans can be developed to proactively handle these potential exceedances (this concept is consistent with the Management Response Framework concept). In DeBeers case, TDS concentrations, nitrate, strontium, and annual loadings are items of concern.</p> <p>AANDC notes the annual AEMP programs are designed to identify these problem parameters such that there are no surprises and options can be considered and investigated by the licensee prior to exceedances.</p> <p>Recommendation:</p> <p>AANDC recommends this clause be revised to suggest that if monitoring results indicate an exceedance of an Action Level, the Board be notified immediately e.g. within 30 days of receipt of laboratory results. A Draft Management Response Plan shall be prepared and submitted within 30 days of notification of the exceedance to the Board</p> | <p>when the exceedance is first detected, for example, in the monthly SNP Report or otherwise (depending on what type of Action Level is exceeded). Action Levels may not necessarily always be tied to the results of a single laboratory test. De Beers does not recommend that the Licence require an AEMP Response Plan within a specified amount of time, but rather believes that the time required for a Response Plan should be left to the discretion and direction of the Board. An appropriate Response Plan timeline will likely depend on the type and nature of an Action Plan exceedance.</p> <p>De Beers therefore recommends that section 8 be re-worded as follows:</p> <p>"If any Action Level as defined in the approved AEMP Design Plan is exceeded, the Licensee shall notify the Board, through a monthly SNP Report or otherwise, within 30 days of when the exceedance is detected. The Licensee shall also submit to the Board for approval, within a time specified by the Board, an AEMP Response Plan, which shall satisfy the requirements of Schedule 6, Item 5."</p> | <p>Levels will not be based on a single laboratory results and may take some time to analyze.</p> <p>De Beers has described a reasonable approach in its response that both addresses AANDC's concerns and leaves all parties with the necessary flexibility. However, it may not be prudent to report the exceedance in a monthly SNP report since these may not be read immediately. Instead, it would be better if De Beers simply notified the Board via letter.</p> <p>Board Decision: Replace draft WL language with the following:</p> <p>"If any Action Level as defined in the approved AEMP Design Plan is exceeded, the Licensee shall notify the Board within 30 days of when the exceedance is detected. The Licensee shall also submit to the Board for approval, within a time specified by the Board, an AEMP Response Plan, which shall satisfy the requirements of Schedule 6, Item 5."</p> | <p>the exceedance is detected. The Licensee shall also submit to the Board for approval, within a time specified by the Board, an <i>AEMP Response Plan</i>, which shall satisfy the requirements of Schedule 6, Item 5.</p> |
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| | for review and approval. | | | |
| | <p>This seems backward. Shouldn't the Response Plan be in place before any action level is exceeded? Otherwise, we wait until a plan is developed to act (which perpetuates response-based action, rather than pro-active management). Basically, if you're approaching an action level, get a response plan approved.</p> <p>Recommendaiton:</p> <p>Establish a date for AEMP Response Plans prior to the need (similar to Part E (3) of the old W.L., "submit to the Board for approval a minimum of 90 days prior to the exceedance of any action level..."</p> | <p>De Beers notes that the AEMP Design Plan is already required to identify, within an AEMP Response Framework, a general description of what types of actions may be taken if an Action Level is exceeded. De Beers therefore does not agree that this recommendation is required. It is De Beers' understanding that the purpose of the AEMP Response Plan in section 8 is to define <i>with more specificity</i> the actions that will be taken in a given case.</p> | <p>The Board's draft guidelines for the Response Framework make it clear that the response comes after an action level is exceeded. This is possible because there are to be tiered levels so that the exceedance of any one level is not in itself an emergency. De Beers assumptions as written in their response is correct.</p> <p>Board decision: Retain draft WL language.</p> | |
| 9. The Licensee shall implement the AEMP Response Plan as and when approved by the Board. | | | New condition necessary due to conditions above | 10. The Licensee shall implement the AEMP Response Plan as and when approved by the Board. |
| 10. The Licensee shall update the AEMP Response Plan as directed by the Board. | | | New condition necessary due to conditions above | 11. The Licensee shall update the <i>AEMP Response Plan</i> as directed by the Board. |
| 11. If not approved by the Board, the plans referred to in Part G, Items 3 and 9 shall be revised and resubmitted in accordance with directives from the Board. | | | Update of condition in Part G, Item 6 of MV2001L2-0002 | 12. If not approved by the Board, the plans referred to in Part G, Items 3 and 9 shall be revised and resubmitted in accordance with directives from the Board. |
| PART H: CONDITIONS APPLYING TO CONTINGENCY PLANS | | | | |
| <p>Board Staff notes of clarification to reviewers:</p> <ul style="list-style-type: none"> proposed changes to conditions are based on | The new W.L. seems to have removed the condition associated with Clause 5 of the | De Beers does not believe that this recommendation is | The Annual Report (Schedule 1) Item 1.u. | |

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| <p>recommendations or to be consistent with other Type A water licences</p> | <p>old W.L. (to report on all activities undertaken and provide all documentation produced under the Plans as part of the Annual Report described in Part B, Item 5.</p> <p>Recommendation: Add <i>"The Licensee shall report on all activities undertaken and provide all documentation produced under the Plans as part of the Annual Report described in Part B, item 7"</i>.</p> | <p>necessary. De Beers agrees to have all appropriate documentation available upon request and will insert all necessary documentation if appropriate and if it allows for increased understanding of decision making.</p> | <p>states that De Beers must submit annually: <i>A summary of any updates or revisions made during the previous calendar year to the Spill Contingency Plan and the Emergency Response Plan.</i> In addition the Annual report has a spills section, Item 1.w., which requires De Beers to provide a list, description, summary of circumstances, and follow-up action taken for all unauthorized discharges. These requirements are meant to adequately cover off the intent of the old Part H Item 5.</p> <p>Board Decision: Retain draft WL language</p> | |
| <p>1. The Licensee shall operate under a Spill Contingency Plan, as approved by the Board, and developed in accordance with the Aboriginal Affairs and Northern Development's (AANDC) <i>Guidelines for Spill Contingency Planning, 2007</i>, or subsequent editions.</p> | <p>There needs to be wording which defines/specifies the content, time for submission for approval, etc. of the Spill Contingency Plan.</p> <p>Recommendation: Add wording which specifies the content, time for submission for approval of the SCP.</p> | <p>De Beers does not believe this recommendation is necessary, given that the Spill Contingency Plan and Emergency Response Plans are already required to be reviewed annually or as requested by the Inspector or the Board.</p> | <p>Partial replacement of condition Part H, Item 1 of MV2001L2-0002.</p> <p>The content is outlined in the Guidelines and the existing approved plan. Any changes to the plan will be submitted annually and may go to the Board for approval as per the next condition.</p> <p>Board Decision: Retain draft WL language</p> | <p>1. The Licensee shall operate under a Spill Contingency Plan, as approved by the Board, and developed in accordance with the Aboriginal Affairs and Northern Development's (AANDC) <i>Guidelines for Spill Contingency Planning, 2007</i>, or subsequent editions.</p> |
| <p>2. The Spill Contingency Plan shall be reviewed annually by the Licensee or as requested by the inspector or the Board. Any updates shall be made and a revised plan shall be submitted to the Board for</p> | <p>What version of the Spill Plan is currently approved by the Board? AANDC notes that there is no requirement/date for submission of the Plan for approval. There should be a requirement for submission of a revised</p> | <p>Please see above.</p> | <p>Update of condition Part H, Item 3 of MV2001L2-0002 but specific for only the spill plan.</p> <p>See comment above</p> | <p>2. The Spill Contingency Plan shall be reviewed annually by the Licensee or as requested by the inspector or the Board. Any updates shall be made and a revised plan shall be</p> |

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| <p>approval. If not approved by the Board, the Spill Contingency Plan shall be revised and resubmitted in accordance with directives from the Board.</p> | <p>version following a water licence renewal.</p> <p>Recommendation:</p> <p>Include a submission date for the Spill Contingency Plan for approval. Follow-up plans can be required at the request of the Board or when updates are required based on further development or changes at the site.</p> | | <p>regarding updates to plan.</p> | <p>submitted to the Board for approval. If not approved by the Board, the Spill Contingency Plan shall be revised and resubmitted in accordance with directives from the Board.</p> |
| <p>3. The Licensee shall operate under an Emergency Response Plan as approved by the Board.</p> | <p>There needs to be wording which defines the content, time for submission for approval, etc. of the Emergency Response Plan.</p> <p>Recommendation:</p> <p>Add wording which specifies the content, time for submission for approval of the ERP.</p> | <p>Please see above.</p> | <p>Requirement was previously in Part H, Item 1 of MV2001L2-0002.</p> <p>There are no templates outlining the content of what should be in a Emergency Response Plan, but De Beers currently have an approved plan that everyone has had a chance to provide comment on. The updating format is outlined below. See the above comments at the top of Part H above.</p> <p>Board Decision: Retain draft WL language.</p> | <p>3. The Licensee shall operate under an Emergency Response Plan as approved by the Board.</p> |
| <p>4. The Emergency Response Plan shall be reviewed annually by the Licensee or as requested by the Inspector or the Board. Any updates shall be made and a revised plan shall be submitted to the Board for approval. If not approved by the Board, the Emergency Response Plan shall be revised and resubmitted in accordance with directives from the Board.</p> | <p>Same comment applies for Emergency Response Plan as for the Spill Contingency Plan (above).</p> <p>Recommendation:</p> <p>Same recommendation applies for the Emergency Response Plan as for the Spill Contingency Plan (above).</p> | <p>Please see above.</p> | <p>Update of condition Part H, Item 3 of MV2001L2-0002 but specific for only the emergency response plan.</p> <p>See comments under Item 2.</p> | <p>4. The Emergency Response Plan shall be reviewed annually by the Licensee or as requested by the Inspector or the Board. Any updates shall be made and a revised plan shall be submitted to the Board for approval. If not approved by the Board, the Emergency Response Plan shall be revised and resubmitted in accordance with directives</p> |

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| | | | | from the Board. |
| <p>5. If, during the period of the Licence, an unauthorized discharge of Waste occurs or if such a discharge is foreseeable, the Licensee shall:</p> <p>a) Implement relevant components of the Spill Contingency Plan and the Emergency Response Plan;</p> <p>b) Report the incident immediately via the 24-hour Spill Report Line (867) 920-8130 which is in accordance with the instructions contained in the Spill Report form NWT 1752/0593; and</p> <p>c) Submit a detailed report on each occurrence not later than thirty (30) days after initially reporting the event.</p> | | | Update of condition Part H, Item 4 of MV2001L2-0002 | <p>5. If, during the period of the Licence, an unauthorized discharge of Waste occurs or if such a discharge is foreseeable, the Licensee shall:</p> <p>a. Implement relevant components of the Spill Contingency Plan and the Emergency Response Plan;</p> <p>b. Report the incident immediately via the 24-hour Spill Report Line (867) 920-8130 which is in accordance with the instructions contained in the Spill Report form NWT 1752/0593; and</p> <p>c. Submit a detailed report on each occurrence not later than thirty (30) days after initially reporting the event.</p> |
| PART I: CONDITIONS APPLYING TO CLOSURE AND RECLAMATION | | | | |
| <p>Board Staff notes of clarification to reviewers:</p> <ul style="list-style-type: none"> We have proposed that updates to the ICRP shall be in "accordance with directives from the Board" so that the Board may use the CRP guidelines as and when approved in 2012. other proposed changes to conditions are based on recommendations or to be consistent with other Type A water licences | <p>The review process of the current Interim Mine Closure and Reclamation Plan does not appear to be over.</p> <p>Recommendation: Specify a due date for the submission of the Interim Mine Closure and Reclamation Plan</p> | <p>Please see De Beers' comment directly below.</p> | <p>The review process for the closure and reclamation plan (CRP) was put on hold until completion of the water licence renewal and the nearly completed closure and reclamation guidelines are finalized.</p> <p>De Beers has submitted an updated CRP, however it does not conform with the Board's guidelines that are</p> | |

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| | | | <p>nearly completed. Therefore, once the licence and the guidelines are approved, a directive will be prepared as per condition 1, detailing what will be required in the updated CRP submission.</p> <p>See recommendation under Item 2 below.</p> | |
| <p>1. The Licensee shall implement the Interim Abandonment and Restoration Plan as approved under Licence MV2001L2-0002. Updates to this Plan (hereafter referred to as the Closure and Reclamation Plan) shall be in accordance with directives from the Board.</p> | | | <p>New condition to ensure continuity with previously approved plans. Also specifies that updates will be based on “directives from the Board” – see comments above as well as the discussion in Part I of the Reasons for Decision.</p> | <p>1. The Licensee shall implement the Interim Abandonment and Restoration Plan as approved under Licence MV2001L2-0002. Updates to this plan (hereafter referred to as the Closure and Reclamation Plan) shall be in accordance with directives from the Board.</p> |
| <p>2. The Licensee shall submit to the Board for approval updates of the Closure and Reclamation Plan at the following times:</p> <ul style="list-style-type: none"> a) Within nine (9) months of issuance of this Licence; b) Every three (3) years from the date of approval; and c) Upon the request of the Board. | | <p>De Beers submitted an update to the Closure and Reclamation Plan on May 29, 2011 and it was De Beers' understanding that this update would be reviewed following the Licence Renewal process. Rather than re-submitting an update within 9 months of issuance of the Licence, De Beers recommends that a review of the spring 2011 Plan be commenced (and therefore, s. 2(a) be removed). De Beers awaits direction from the Board on the review and consultation process for this Plan.</p> | <p>Board is developing CRP guidelines. Upon finalization of the guidelines the Board will provide De Beers with a submission date for the submission of the updated CRP.</p> <p>Board Decision: Remove the requirement to submit an update of the CRP plan within 9 months of licence issuance. The Board will direct the timeframe for CRP submission in a directive after licence issuance.</p> | <p>2. The Licensee shall submit to the Board for approval updates of the <i>Closure and Reclamation Plan</i> at the following times:</p> <ul style="list-style-type: none"> a. Every three (3) years from the date of approval; and b. Upon the request of the Board. |
| <p>3. An Annual Closure and Reclamation Plan (CRP) Progress Report shall be submitted annually by March 31. If the Progress Report identifies any</p> | <p>Revise the second sentence to include this recommendation to ensure security held by the Crown is adequate at all times and</p> | <p>De Beers does not believe that this recommendation is necessary, as the Board already</p> | <p>Agree with De Beers that there is a condition in the security section that at the</p> | <p>3. An Annual Closure and Reclamation Plan (CRP) Progress Report shall be submitted annually by April 30. If the Progress Report identifies any proposed</p> |

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| <p>proposed changes to the CRP or other information identified by the Board, the Progress Report will be submitted for Board approval.</p> | <p>following any changes to the CRP. <u>Recommendation:</u> Add this sentence to the clause, "If there are changes to the CRP which would warrant an increase to security they should be fully described and an estimate of the reclamation cost associated with these changes provided for review and approval by the Board."</p> | <p>has discretion in the draft Licence to require a different security amount based on updated estimates of current mine reclamation liability.</p> | <p>discretion of the Board, it can request a security estimate. This would potentially allow for any party to request an estimate with a reason. Furthermore, there is nothing precluding AANDC from providing an updated security estimate to the Board if the estimate has changed.</p> <p>The purpose of this condition is to allow De Beers to provide an update of annual activities without resubmitting the entire CRP. The progress report identifies any changes to the CRP, then the changes and the progress report will be for Board approval. Once approved the changes identified in the progress report can be made to the CRP, without having to open up the whole CRP for review.</p> <p>Board Decision: Retain draft WL language with the exception of the submission date as discussed below.</p> | <p>changes to the CRP or other information identified by the Board, the Progress Report will be submitted for Board approval.</p> |
| | <p>Change the due date to March 1st.</p> <p>Add a schedule adding "the Annual MRSR shall report on closure and reclamation related activities conducted during the preceding calendar year. The topics shall include but not be restricted to":</p> <p>a. A description of the status or project activities (ie., construction, mining, processing, etc.) as compared to the project schedule and a description of</p> | <p>De Beers agrees that reviewers are over-taxed in March. Further, it makes more sense for the Closure and Reclamation Plan progress report to be submitted after the Water License Annual Report is submitted on March 31 so that this information can be referenced. Accordingly, De Beer requests that the date for submission of the Closure and Reclamation Plan progress report be April 30.</p> | <p>Agree that a later submission date is reasonable.</p> <p>Board Decision: Change the due date for submission to April 30.</p> <p>Note: This condition is the evolution/replacement of the old DeBeers WL item I.8, DDMI, BHP closure conditions item 4 and Talston's item I.3. The idea is</p> | |

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- the implications of any variances for the ICRP.
- b. The results of reclamation performance and environmental monitoring programs related to the ICRP.
 - c. The results of research studies carried out under the Reclamation Research Plan, a description of how those results have been integrated into other project activities and a description of research studies planned for the following year;
 - d. A description of progressive reclamation work undertaken and an outline of work scheduled for the following year;
 - e. An evaluation of the success of all progressive reclamation work conducted over the life of the project as measure against the ICRP objectives, including an interpretation of the results of the monitoring and research programs;
 - f. A description of any proposed changes to the approved ICRP.
 - g. An updated estimate of the total reclamation liability at year end, a detailed comparison against the approved liability estimate and a detailed explanation of variances; and
 - h. A detailed presentation of the costs expended on progressive reclamation work annually over the life of the project, a detailed description of how the progressive reclamation work fulfilled the objectives of the approved ICRP and a complete rationale for any requested reduction in the reclamation security requirement supported by results of the monitoring and research programs

De Beers is not opposed to the inclusion of subsections (a), (c) and (d) in the second recommendation. De Beers disagrees with the inclusion of the remaining proposed revisions, as they are either covered in other plans or reports or they are unnecessary or better suited for inclusion in updates to the Closure and Reclamation Plan, which are required to be submitted every 3 years, at a minimum (see section 2 above). Further, updates to the reclamation liability estimate are dealt with elsewhere in the Licence.

to have the proponent only update what has changed and not resubmit the whole plan as has happened in the past. It will only go to the Board if there are updates to the plan.

No schedules were included for the closure section due to the pending closure guidelines. The guidelines contain a template that will likely be provided to De Beers as the directive (condition 1 shortly after licence approval). The guidelines also discuss reclamation research plans and the progress report. The intention is that in the directive, much greater detail will be provided outlining what is required in the plans. The idea was purposely not to put too much detail in the actual licence since the closure guidelines are always evolving.

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| | <p>that demonstrate that the closure and reclamation objectives have been achieved.</p> <p>Consider adding the conditions from the previous WL (I (6) a-f) to this section (perhaps as a schedule).</p> | | | |
| <p>4. The Licensee shall, a minimum of twenty-four (24) months prior to the end of operations, submit to the board for approval a Final Closure and Reclamation Plan.</p> | | | <p>Update of condition Part I, Item 9 in MV2001L2-0002 for consistency with other water licences.</p> | <p>4. The Licensee shall, a minimum of twenty-four (24) months prior to the end of operations, submit to the Board for approval a <i>Final Closure and Reclamation Plan</i>.</p> |
| <p>PART J: CONDITIONS APPLYING TO MODIFICATIONS</p> | | | | |
| <p>Board Staff notes of clarification to reviewers:</p> <ul style="list-style-type: none"> changes to conditions are proposed to be consistent with other Type A water licences | | | | |
| <p>1. The Licensee may carry out Modifications to the Water supply and Waste disposal facilities provided that such Modifications are consistent with the terms of this Licence and the following requirements are met:</p> <ol style="list-style-type: none"> The Licensee has notified the Board in writing of such proposed Modifications at least sixty (60) days prior to beginning the Modifications; The Board has not, during the sixty (60) days following notification of the proposed Modifications, informed the Licensee that review of the proposal will require additional time; The Board has not rejected the proposed Modifications; and An Inspector has authorized the proposed Modifications and provided a letter of notification to the Board. | | | <p>Update of condition Part J, Item 1 of MV2001L2-0002 for consistency with other licences.</p> | <p>1. The Licensee may carry out Modifications to the Water supply and Waste disposal facilities provided that such Modifications are consistent with the terms of this Licence and the following requirements are met:</p> <ol style="list-style-type: none"> The Licensee has notified the Board in writing of such proposed Modifications at least sixty (60) days prior to beginning the Modifications; The Board has not, during the sixty (60) days following notification of the proposed Modifications, informed the Licensee that review of the proposal will require additional time; The Board has not rejected the proposed Modifications; and An Inspector has authorized the proposed |

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| | | | | Modifications and provided a letter of notification to the Board. |
| 2. Modifications for which all the conditions in Part J, Item 1 have not been met may be carried out only with written approval from the Board. | | | Condition unchanged from MV2001L2-0002 | 2. Modifications for which all the conditions in Part J, Item 1 have not been met may be carried out only with written approval from the Board. |
| 3. The Licensee shall provide to the Board as-built plans and drawings of the Modifications referred to in this Licence within ninety (90) days of completion of the Modifications. | | | Condition unchanged from MV2001L2-0002 | 3. The Licensee shall provide to the Board as-built plans and drawings of the Modifications referred to in this Licence within ninety (90) days of completion of the Modifications. |
| Schedule's Annexed to the Licence | | | | |
| SCHEDULE 1 PART B: GENERAL CONDITIONS Annual Water Licence Report Part B, Item 7 | | | | |
| <p>Board Staff notes of clarification to reviewers:</p> <ul style="list-style-type: none"> We have proposed reformatting of requirements for clarity and for consistency with other Type A water licences We have proposed reporting requirements for actions taken under Response Framework for Water Management Plan or North Pile Management Plan other proposed changes to requirements are based on recommendations or to be consistent with other Type A water licences | <p>Two more items are indentified for annual Water Licence reporting.</p> <ul style="list-style-type: none"> During the Public Hearing, De Beers recommended that the key outcomes of Environmental Management System (ISO 14001) audit and management review were included into the Water Licence Annual Report as a section (page 132-133 of December 13, 2011 Transcript), based on SLEMA comments dated December 6, 2011. The Inspector's reports identify some concerns and require follow-up or mitigation. The responses from De Beers should be included into the Water Licence Annual Report. <p>Recommendation: Add those two items to Schedule 1, Other Reporting Requirements</p> | <p>De Beers disagrees that there should be defined due dates for submission of the ISO report and corresponding mitigative actions. The ISO audit is conducted on varying dates and De Beers commits to submitting a letter with outcomes within 60 days of receiving the final audit report.</p> <p>In regards to Inspector concerns, De Beers responds to these issues on a case-by-case basis; inclusion in the Annual Report would only result in unnecessary duplication.</p> | <p>Submission of ISO audits and reviews are not typically requirements of water licences and the Board heard no compelling evidence of why it should be different in this case. The fact that De Beers has agreed to submit these items indicates that they are not confidential documents and that parties, including SLEMA, can and should request them directly from De Beers.</p> <p>There is a section specifically listing inspection reports on the Board's public registry; thus, these reports are not</p> | |

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| | | | <p>difficult to find. Agree with De Beers that this would cause unnecessary duplication.</p> <p>Board Decision: Do not add items suggested by SLEMA to Annual Report requirements.</p> | |
| 1. The Annual Water Licence Report referred to in Part B, Item 7 shall include, but not be limited to, the following: | | | Requirements moved from Part B, Item 5 of MV2001L2-0002 | 1. The Annual Water Licence Report referred to in Part B, Item 7 shall include, but not be limited to, the following: |
| <u>Quantities and Measurements Reporting on Water and Waste</u> | | | | Quantities and Measurements Reporting on Water and Waste |
| a) Monthly and annual quantities in cubic metres of Water removed from Snap Lake; | | | Update of Part B, Item 5a)i. | a) Monthly and annual quantities in cubic metres of Water removed from Snap Lake; |
| b) Monthly and annual quantities in cubic metres of all Discharges from the permanent and temporary (if applicable) Water Treatment Plants; | | | Update of Part B, Item 5a)ii | b) Monthly and annual quantities in cubic metres of all Discharges from the permanent and temporary (if applicable) Water Treatment Plants; |
| c) Monthly and annual quantities in cubic metres of treated Sewage effluent from the Sewage Treatment Plant (STP2) and any temporary Sewage Treatment Plant, if applicable; | | | Update of Part B, Item 5a)iii | c) Monthly and annual quantities in cubic metres of treated Sewage effluent from the Sewage Treatment Plant (STP2) and any temporary Sewage Treatment Plant, if applicable; |
| d) Monthly and annual quantities in cubic metres of Water pumped into the North Pile | | | Update of Part B, Item 5a)iv; now requires volumes water | d) Monthly and annual quantities in cubic metres of Water pumped into the North Pile Facility |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| Facility including the volume of the liquid fraction of the Slurry and/or Paste; | | | in of slurry/paste | including the volume of the liquid fraction of the Slurry and/or Paste; |
| e) Monthly and annual quantities in cubic metres of Water reporting to the sumps from the North Pile Facility; | | | New condition based on concerns with amount of water accumulating in North Pile sumps | e. Monthly and annual quantities in cubic metres of Water reporting to the sumps from the North Pile Facility; |
| f) Monthly and annual quantities in cubic metres of Minewater pumped from the Mine to the Water Treatment Plant; | <p>What about water pumped from the Water Management Pond to the Water Treatment Plant?</p> <p>Recommendation:</p> <p>Add water from the Water Management Pond to this clause.</p> | De Beers agrees with this recommendation. | <p>Update of Part B, Item 5a)v</p> <p>Board Decision: Add water from the Water Management Pond to this condition.</p> | f. Monthly and annual quantities in cubic metres of Water pumped from the Mine and the Water Management Pond to the Water Treatment Plant; |
| g) Monthly and annual quantities in cubic metres of Water and Wastewater pumped into and out of the Water Management Pond; | <p>Remove 'out' of the Water Management Pond because water pumped from the Pond reports to the Water Treatment Plant. The Water Treatment Plant has a separate reporting requirement above.</p> <p>Recommendation:</p> <p>Remove 'out' of the Water Management Pond.</p> | De Beers agrees with this recommendation. | <p>Update of Part B, Item 5a)vii</p> <p>Board Decision: Remove the words "and out" from the condition.</p> | g. Monthly and annual quantities in cubic metres of Water and Wastewater pumped into the Water Management Pond; |
| h) Monthly and annual estimates and measurements of precipitation and runoff; | | | Previously Part B, Item 5a)ix | h) Monthly and annual estimates and measurements of precipitation and runoff; |
| i) Monthly elevations of Water in Snap Lake during the open Water season; | | | Previously Part B, Item 5b) | i) Monthly elevations of Water in Snap Lake during the open Water season; |
| j) Monthly elevations of Water in the Water Management Pond and a stage volume | | | Previously Part B, Item 5c) | j. Monthly elevations of Water in the Water Management Pond and a stage volume curve |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| curve for the pond; | | | | for the pond; |
| <p>k) The annual quantities in cubic metres of each of Fine, Grits, and Coarse Processed Kimberlite or Paste placed as underground backfill;</p> | | <p>Identification of fines, grits, and coarse Processed Kimberlite is an overly onerous requirement that is unnecessary. De Beers recommends that this provision be re-worded as follows:</p> <p>"The annual quantities in cubic metres of Processed Kimberlite or Paste placed as underground backfill".</p> | <p>Update of Part B, Item 5e)</p> <p>The concern is that the original plan was to report the amount of PK, and the EA wanted to keep track of the quantities of waste materials produced. So if we ask for paste we are getting PK and other additives. Do we need to ask for Paste and the volume of PK?</p> <p>Board Decision: we accept de beers' recommendation, but we change the 'or' to 'and' in order to be sure that we have all the information.</p> | <p>k. The annual quantities in cubic metres of Processed Kimberlite and Paste placed as underground backfill;</p> |
| <p>l) The annual quantities in cubic metres of each of Fine, Grits, and Coarse Processed Kimberlite or Paste placed in the North Pile Facility;</p> | <p>Since De Beers is adding Slurry to the Starter Cell, and proposing adding slurry to Cell 5 of the East Cell, the MVLWB should consider adding a specific condition to report on the volumes of slurry deposited into the North Pile.</p> <p>Recommendation:</p> <p>Add slurry to the wording (<i>"The annual quantities in cubic metres of each of Fines, Grits, and Coarse Processed Kimberlite <u>slurry</u> or paste placed in the North Pile Facility"</i>).</p> | <p>De Beers does not believe that this recommendation is necessary as the original wording is sufficient.</p> | <p>Update of Part B, Item 5d).</p> <p>Slurry and paste are a combination of the different fractions of PK combined with different volumes/proportions of water. Condition d. above requires the volume of the liquid fraction of the slurry or paste in cubic meters. Therefore the combined conditions d. and l. provide enough information on the water and solids relationship within the NP.</p> | <p>l. The annual quantities in cubic metres of each of Fine, Grits, and Coarse Processed Kimberlite or Paste placed in the North Pile Facility;</p> |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| | | | Board Decision: Keep draft wording. | |
| m) Annual quantities in cubic metres of Waste Rock placed in the North Pile Facility, identifying the classification of quantities of each rock type (granite or metavolcanic rock); | <p>What about the waste rock placed in the underground?</p> <p>Recommendation:</p> <p>Add this to the reporting requirements for waste rock tracking purposes.</p> | Presently there is no reason to place waste rock in the underground, as waste rock is prioritized to be used for construction above ground. Therefore, this recommendation is not necessary. | <p>Update of Part B, Item 5f)</p> <p>Board Decision: Retain draft WL language</p> | m) Annual quantities in cubic metres of Waste Rock placed in the North Pile Facility, identifying the classification of quantities of each rock type (granite or metavolcanic rock); |
| n) The annual quantities in cubic metres of other solid Waste placed in the North Pile; | <p>The Landfill should be specifically mentioned here as the disposal location for 'other waste'. If not, 'other waste' could be authorized for disposal in any and all areas of the North Pile. AANDC understands the landfill is currently located in the Starter Cell and DeBeers has plans to move the landfill to the West Cell.</p> <p>Recommendation:</p> <p>Update this clause to state, "The annual quantities in cubic metres of other solid Waste placed in the Landfill;"</p> | De Beers agrees with this recommendation. | <p>Update of Part B, Item 5g)</p> <p>Board Decision: Make changes as suggested.</p> | n) The annual quantities in cubic metres of other solid Waste placed in the North Pile; |
| o) The annual quantities in cubic metres of Waste Rock placed for construction activities, including a diagram showing where it was placed, and identification of the classification of quantities by each rock type (granite or metavolcanic rock); | | | Partial replacement and update of Part B, Item 5h) | o) The annual quantities in cubic metres of Waste Rock placed for construction activities, including a diagram showing where it was placed, and identification of the classification of quantities by each rock type (granite or metavolcanic rock); |
| p) Tabular summaries of all data and information generated under the Surveillance Network Program including analysis and interpretation and a discussion of any variances from baseline conditions or from previous years' data. This information | | <p>De Beers recommends that this section be re-worded as follows:</p> <p>"Tabular summaries of all data and information generated under the Surveillance Network Program. This information should</p> | <p>Update of Part B, Item 5n)</p> <p>The wording in question came from Keno Hill in the Yukon. It is unclear what could be gained by analysis and interpretation of SNP that</p> | p) Tabular summaries of all data and information generated under the Surveillance Network Program. This information should be presented in electronic and printed format acceptable to the Board; |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| <p>should be presented in electronic and printed format acceptable to the Board;</p> | | <p>be presented in electronic and printed format acceptable to the Board.”</p> <p>The analysis and interpretation and discussion of any variances from baseline conditions or from previous years' data are undertaken in the AEMP.</p> | <p>is not captured by the various Management Plans.</p> <p>Variances from baseline in the receiving environment are discussed in the AEMP reports, however, SNP data is typically taken from onsite facilities which are not analyzed in the AEMP.</p> <p>Board Decision: accept De Beers suggestion to remove the analysis and interpretation</p> | |
| <p><u>Management Plans and Activities</u></p> | | | | <p>Management Plans and Activities</p> |
| <p>q) A summary of Construction activities and an updated Mine Plan;</p> | | | <p>Partial replacement and update of Part B, Item 5h) and 5l)</p> | <p>q) A summary of Construction activities and an updated Mine Plan;</p> |
| <p>r) A summary of all work carried out under the approved North Pile Management Plan (required as per Part E, Item 8) during the previous calendar year including:</p> <ul style="list-style-type: none"> a. a summary of materials deposited to the North Pile Facility including an updated map or diagram showing the location of the deposited materials; b. a summary and interpretation of monitoring results including any Action Level exceedances; and c. a description of actions taken in response to any Action Level exceedances under the Response | | | <p>Based on condition in Part B, Item 5j) and includes requirements for reporting on action level exceedances for Response Framework.</p> | <p>r) A summary of all work carried out under the approved North Pile Management Plan (required as per Part E, Item 8) during the previous calendar year including:</p> <ul style="list-style-type: none"> i. a summary of materials deposited to the North Pile Facility including an updated map or diagram showing the location of the deposited materials; ii. a summary and interpretation of monitoring results including any Action Level exceedances; |

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| <p>Framework.</p> | | | | <ul style="list-style-type: none"> iii. a description of actions taken in response to any Action Level exceedances under the Response Framework; and iv. A summary of investigations or activities related to Paste deposition including an updated schedule for Paste deposition underground and in the North Pile. |
| <p>s) A summary of all work carried out under the approved Water Management Plan (required as per Part F, Item 5) during the previous calendar year including:</p> <ul style="list-style-type: none"> i. a summary of updates or changes to the process or facilities required for the management of Water and Wastewater; ii. a summary and interpretation of monitoring results including any Action Level exceedances; iii. a description of actions taken in response to any Action Level exceedances under the Response Framework; and iv. results from the hydrogeological modeling of the quantity and sources of TDS in Minewater. The model results shall be compared to previous predictions of Minewater discharge, and any changes in input parameters or assumptions shall be clearly described. | <p>Modifications/Updates to the mean monthly and annual water balance are required given the dynamic nature of mine inflows experience in 2011 and the overall water content within the North Pile.</p> <p>Recommendation: Add, "a mean monthly and annual water balance evaluation for the mine site and North Pile."</p> | <p>De Beers agrees with this recommendation.</p> <p>Section s(iv) could be interpreted as requiring updated modeling on an annual basis. De Beers recommends that section s(iv) be re-worded as follows:</p> <p>"results from the hydrogeological modelling of the quantity and sources of TDS in Minewater compared to previous predictions of Minewater discharge. If Action Level exceedances result in additional modelling requirements, then the new model results shall be compared to previous predictions of Minewater discharge, and any changes in input parameters or assumptions shall be clearly described."</p> | <p>Based on condition in Part B, Item 5j) and includes requirements for reporting on action level exceedances for Response Framework plus condition in Part B, Item 5s) of MV2001L2-0002.</p> <p>Due to the considerable issues De Beers is having with Water management onsite (water management pond and NP), it is appropriate to ask for a whole site water balance. Since it should be for the whole site the Water Management Plan is the most logical place for it. The issue with adjusting condition s.iv.(as per De Beers recommendation) is that it is specific to TDS. The focus should be on a water balance not on a specific parameter.</p> <p>Board Decision: Accept the</p> | <p>s) A summary of all work carried out under the approved <i>Water Management Plan</i> (required as per Part F, Item 5) during the previous calendar year including:</p> <ul style="list-style-type: none"> i. a summary of updates or changes to the process or facilities required for the management of Water and Wastewater; ii. a summary and interpretation of monitoring results including any Action Level exceedances; iii. a description of actions taken in response to any Action Level exceedances under the Response Framework; and iv. results from the hydrogeological modeling of the quantity and sources of TDS in Minewater. The model results shall be compared to previous predictions of Minewater discharge, and any changes in input parameters or assumptions shall be |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| | | | AANDC recommendation. | clearly described. v. a mean monthly and annual water balance evaluation for the mine site and North Pile. |
| t) A summary of all work carried out under the approved Waste Management Plan; | | | New condition to reflect new plan requirement | t) A summary of all work carried out under the approved <i>Waste Management Plan</i> ; |
| | | | Condition added to allow for annual updates to the mentioned response plans | u) Summary of progress for the Strontium Response Plan, TDS Response Plan, and the Nitrogen Response Plan. The summary shall detail any updates and work completed during the previous calendar year. |
| u) A summary of any updates or revisions made during the previous calendar year to the Spill Contingency Plans and the Emergency Response Plan; | | | Update of Part B, Item 5p) | v) A summary of any updates or revisions made during the previous calendar year to the <i>Spill Contingency Plans</i> and the <i>Emergency Response Plan</i> ; |
| v) A summary of all Modification work undertaken during the previous calendar year in accordance with Part J; | | | New condition for consistency with other water licences | w) A summary of all Modification work undertaken during the previous calendar year in accordance with Part J; |
| <u>Spills and Unauthorized Discharges</u> | | | | |
| w) A list and description, including date, spill number, volume, location, and summary of the circumstances and follow-up action taken for all Unauthorized Discharges, in accordance with the reporting requirements | | | Update of Part B, Item 5q) | x) A list and description, including date, spill number, volume, location, and summary of the circumstances and follow-up action taken for all Unauthorized Discharges, in |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| in Part H, Item 5; | | | | accordance with the reporting requirements in Part H, Item 5; |
| x) An outline of any spill training and communications exercises carried out; | | | Update of Part B, Item 5r) | y) An outline of any spill training and communications exercises carried out; |
| <u>Other Reporting Requirements</u> | | | | <u>Other Reporting Requirements</u> |
| y) A progress report on any studies or plans, including Response Plans, requested by the Board and a brief description of any future studies planned by the Licensee; and | | | Update of Part B, Item 5o) | z) A progress report on any studies or plans, including Response Plans, requested by the Board and a brief description of any future studies planned by the Licensee; and |
| z) Any other details on Water use or Waste disposal requested by the Board by November 1 of the year being reported. | | | Previously Part B, Item 5v) | aa)Any other details on Water use or Waste disposal requested by the Board by November 1 of the year being reported. |
| SCHEDULE 2 PART C: CONDITIONS APPLYING TO SECURITY REQUIREMENTS | | | | |
| Security Requirements Part C Item 1 | | | | |
| Board Staff notes of clarification to reviewers: | | | | |
| <ul style="list-style-type: none"> Final security amounts will be provided in the final water licence | | | | |
| 1. Pursuant to Section 17 of the Act and Section 12 of the <i>Northwest Territories Waters Regulations</i> , the Licensee shall post security on the schedule set out below and once achieved shall maintain a security deposit totalling \$XX,XXX,XXX.00: a. Security currently maintained \$ | Set an amount of Security as well as a timeline specified in the W.L. | De Beers notes that final security amounts will be provided in the final Licence. | Update of Part C, Item 1-3 of MV2001L2-0002 | 1. Pursuant to section 17 of the Act and section 12 of the Northwest Territories Waters Regulations, the Licensee shall post security on the schedule set out below and once achieved shall maintain a security deposit |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| <p>X,XXX,XXX.00.</p> <p>b. Prior to placement of Processed Kimberlite into the West Cell of the North Pile, the Licensee shall have posted and shall maintain an additional security deposit of \$ X,XXX,XXX.00 to address the estimated increase in total Water related liability resulting from development of the West Cell.</p> | | | | <p>totalling \$39,066,247.00:</p> <p>a) Security currently maintained \$ 36,917,856.00.</p> <p>b) Prior to placement of Processed Kimberlite into the West Cell of the North Pile, the Licensee shall have posted and shall maintain an additional security deposit of \$2,148,391.00 to address the estimated increase in total Water related liability resulting from development of the West Cell.</p> |
| | Specify the amount | Please see above. | Update of Part C, Item 1-3 of MV2001L2-0002 | |
| | <p>This should be known at this time & this number should be included in the W.L.</p> <p>Recommendation:</p> <p>State current securities in the W.L.</p> | Please see above. | | |
| | Specify the amount | Please see above. | Update of Part C, Item 4 of MV2001L2-0002 | |
| | <p>This should be known at this time & this number should be included in the W.L.</p> <p>Recommendation:</p> <p>State current securities in the W.L.</p> | Please see above. | | |
| SCHEDULE 3 | | | | |

| PART D: CONDITIONS APPLYING TO CONSTRUCTION | | | | |
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| <p>1. The Final Detailed Design Report for the North Pile referred to in Part D, Item 5 shall include, but not be limited to, the following:</p> <ul style="list-style-type: none"> a) The results of all geotechnical investigation data for the North Pile footprint relevant to the current construction phase, including the results of a comprehensive delineation program to characteristic soil, rock, ground ice, and ground temperature conditions to the depth expected to be affected by the proposed facilities, beneath the footprint of all containment and runoff control structures; b) Seepage analyses; c) Geothermal analyses; d) Stability analyses; e) Detailed instrumentation and monitoring plans; f) Key design and performance parameters; g) Action Levels; and h) Actions to be taken in the event that Action Levels are exceeded. | | | <p>Previously conditions Part D, Item 1 of MV2001L2-0002; have added reference to Action Levels.</p> | <p>1. The Final Detailed Design Report for the North Pile referred to in Part D, Item 5 shall include, but not be limited to, the following:</p> <ul style="list-style-type: none"> a) The results of all geotechnical investigation data for the North Pile footprint relevant to the current construction phase, including the results of a comprehensive delineation program to characteristic soil, rock, ground ice, and ground temperature conditions to the depth expected to be affected by the proposed facilities, beneath the footprint of all containment and runoff control structures; b) Seepage analyses; c) Geothermal analyses; d) Stability analyses; e) Detailed instrumentation and monitoring plans; f) Key design and performance parameters; g) Action Levels; and h) Actions to be taken in the event that Action Levels are exceeded. |
| <p>2. The Final Detailed Design Report for structures designed to contain, withhold, retain, or divert Water or Waste, not included in the North Pile system, as referred to in Part D, Item 6 shall include, but not be limited to, the</p> | <p style="color: #808000;">What is the difference between action levels and threshold limits? Will actions be taken in the event that threshold limits are exceeded?</p> <p style="color: #808000;">Recommendation:</p> | <p>De Beers agrees that the use of the term "threshold limits" in 2(b) is confusing and consistent terminology (i.e., Action Levels) should be used. De Beers also</p> | <p>Previously conditions Part D, Item 4 of MV2001L2-0002</p> <p>Board Decision: Replace wording in 2b) with wording</p> | <p>2. The Final Detailed Design Report for structures designed to contain, withhold, retain, or divert Water or Waste, not included in the North Pile system, as referred to in Part</p> |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| <p>following:</p> <ul style="list-style-type: none"> a) Measures for managing all Water seepage and/or discharge to Snap Lake during construction and/or operation of any structures designed to contain, withhold, retain, or divert Water or Waste. b) Specific threshold limits which are to be identified in the General Spill and Spill Contingency Plan to control Discharge to Snap Lake; and c) The results of all geotechnical investigation data, design analyses, key monitoring parameters, and threshold exceedance values, and detailed plans for instrumentation and inspection. | <p>Clarification is requested. The definition of threshold limits may be needed if necessary.</p> | <p>recommends that Action Levels identified in Final Detailed Design Reports should be incorporated into the North Pile Management Plan or the Water Management Plan, as appropriate, rather than the Spill Contingency Plan. De Beers recommends that section 2(b) be re-worded as follows:</p> <p>“Action Levels which are to be incorporated into the North Pile Management Plan or the Water Management Plan, as appropriate”.</p> | <p>recommended by De Beers.</p> | <p>D, Item 6 shall include, but not be limited to, the following:</p> <ul style="list-style-type: none"> a) Measures for managing all Water seepage and/or discharge to Snap Lake during construction and/or operation of any structures designed to contain, withhold, retain, or divert Water or Waste. b) Action Levels which are to be incorporated into the North Pile Management Plan or the Water Management Plan, as appropriate; and c) The results of all geotechnical investigation data, design analyses, key monitoring parameters, and threshold exceedance values, and detailed plans for instrumentation and inspection. |
| <p>SCHEDULE 4 PART E: CONDITIONS APPLYING TO WASTE MANAGEMENT</p> | | | | |
| <p>Board Staff notes of clarification to reviewers:</p> <ul style="list-style-type: none"> • We have proposed changes to the requirements of the North Pile Management Plan as per recommendations • We have clarified that the seepage survey results are to be reported in the ARD and Geochemical Characterization Monitoring report to be consistent with current practice and for clarity • other proposed changes to requirements are based on recommendations or to be consistent with other Type A water licences | | | | |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| <p>1. The Geochemical and Geotechnical Inspection Report referred to Part E, Item 3b shall include, but not be limited to, the following:</p> <ul style="list-style-type: none"> a) Documentation of the inspection locations and methodologies; b) The results of the inspection and all problems identified; c) Remedial measures recommended; and d) The status of any remedial measures recommended in the previous year's report with an explanation regarding any recommendations not implemented. | | | <p>New condition based on content of previous reports.</p> | <p>1. The Geochemical and Geotechnical Inspection Report referred to Part E, Item 3b shall include, but not be limited to, the following:</p> <ul style="list-style-type: none"> a) Documentation of the inspection locations and methodologies; b) The results of the inspection and all problems identified; c) Remedial measures recommended; and d) The status of any remedial measures recommended in the previous year's report with an explanation regarding any recommendations not implemented. |
| <p>2. The North Pile Management Plan referred to Part E, Item 8 shall include, but not be limited to, the following:</p> | | | <p>Content of North Pile Management Plan is based on requirements listed in Part E, Item 3 of MV2001L2-0002 as well as content of existing, approved plan.</p> | <p>2. The North Pile Management Plan referred to Part E, Item 8 shall include, but not be limited to, the following:</p> |
| <p>a) Information regarding operation and management:</p> | | | | <p>a) Information regarding operation and management:</p> |
| <p>i. a summary, with appropriate maps or diagrams, of the North Pile Facility and all the Waste streams that report to it;</p> | <p>This clause should include the location of the Landfill and Landfarm. These locations may move during the course of operations but a record of their location is required such that reclamation measures can be imposed at</p> | <p>De Beers does not believe this recommendation is necessary, as the landfill and landfarm are part of the North Pile.</p> | <p>New condition Condition reads that locations of all waste streams must be given and this includes the</p> | <p>i. a summary, with appropriate maps or diagrams, of the North Pile Facility and all the Waste streams that report to it;</p> |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| | <p>these sites, if warranted.</p> <p>Recommendation:</p> <p>The clause should be modified to state, " i. a summary, with appropriate maps or diagrams, of the North Pile Facility, the location of the Landfill and Landfarm and all the Waste streams that report to them;"</p> | | <p>landfill and landfarm.</p> <p>Board Decision: Retain draft WL language.</p> | |
| <p>ii. a schedule of estimated ore to be mined, and Processed Kimberlite and Waste rock to be produced, divided by rock type, tonnage, and destination for the duration of the Licence;</p> | | | <p>Update of Part E, Item 3a) of MV2001L2-0002</p> | <p>ii. a schedule of estimated ore to be mined, and Processed Kimberlite and Waste rock to be produced, divided by rock type, tonnage, and destination for the duration of the Licence;</p> |
| <p>iii. a complete description of the operational procedures and geometric sequencing options for depositing waste rock and Processed Kimberlite in the North Pile for each year of operation of the current licence duration;</p> | | | <p>Previously Part E, Item 3b) of MV2001L2-0002</p> | <p>iii. a complete description of the operational procedures and geometric sequencing options for depositing waste rock and Processed Kimberlite in the North Pile for each year of operation of the current licence duration;</p> |
| <p>iv. a complete description, including site maps to scale, of the proposed kimberlite ore stockpile area and North Pile area;</p> | | | <p>Previously Part E, Item 3c) of MV2001L2-0002</p> | <p>iv. a complete description, including site maps to scale, of the proposed kimberlite ore stockpile area and North Pile area;</p> |
| <p>v. a description of the geochemical criteria for management and placement of potentially acid generating Waste Rock including linkages to the ARD and Geochemical Characterization Plan (as per Part E, Item 12);</p> | | | <p>Update of Part E, Item 3h) of MV2001L2-0002</p> | <p>v. a description of the geochemical criteria for management and placement of potentially acid generating Waste Rock including linkages to the ARD and Geochemical Characterization Plan (as per Part E, Item 12);</p> |

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 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector’s Comments – Black
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| <p>vi. a description of operational procedures related to the deposition of paste into the North Pile Facility;</p> | | | <p>New condition based on concerns with paste deposition</p> | <p>vi. a description of operational procedures related to the deposition of paste into the North Pile Facility;</p> |
| <p>vii. a description of Water management procedures for the North Pile Facility including:</p> <ul style="list-style-type: none"> a. an identification of all potential sources of drainage from each storage site and the distance to the downstream receiving environment; b. a detailed description, including a map or diagram, of the Water control and collections systems related to the North Pile Facility and their predicted performance in terms of flow, capacity, and Water quality parameters; c. A summary of proposed contingency measures for controlling runoff and seepage Water volume, routing, and quality; and d. a summary of any linkages to activities described in the Water Management Plan; | | <p>For consistency, De Beers recommends that the phrase “water control and collections systems related to the North Pile” used in vii(b) be replaced with “structures intended to contain, withhold, divert or retain water or wastes related to the North Pile”.</p> | <p>Update of conditions in Part E, Item 3e) – g) of MV2001L2-0002.</p> <p>Board Decision: Replace wording with that suggested by De Beers.</p> | <p>vii. a description of Water management procedures for the North Pile Facility including:</p> <ul style="list-style-type: none"> a. an identification of all potential sources of drainage from each storage site and the distance to the downstream receiving environment; b. a detailed description, including a map or diagram, of the structures intended to contain, withhold, divert, or retain Water or Wastes related to the North Pile Facility and their predicted performance in terms of flow, capacity, and Water quality parameters; c. A summary of proposed contingency measures for controlling runoff and seepage Water volume, routing, and quality; and d. a summary of any linkages to activities described in the <i>Water Management Plan</i>; |
| <p>viii. any other information required to describe how the North Pile Facility will be managed and operated such that the objectives listed in Part E, Item 6 of the</p> | | | <p>New condition</p> | <p>viii. any other information required to describe how the North Pile Facility will be managed and operated such that the objectives listed in Part E, Item 6 of the</p> |

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 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| Licence will be met. | | | | Licence will be met |
| b) Information regarding monitoring including: | | | | b) Information regarding monitoring including: |
| ii. details and rationale for monitoring of geotechnical stability, thermal characterization, seepage quality and quantity, and run-off for all components of the North Pile Facility including: <ul style="list-style-type: none"> i. monitoring locations, types of instrumentation used, and frequency of monitoring, including a site map to scale; ii. predicted performance values based on expected facility design; and iii. linkages, if any, to other monitoring requirements in the Licence; | | | Update of conditions in Part E, Item 3d) and 3i) of MV2001L2-0002. | i. details and rationale for monitoring of geotechnical stability, thermal characterization, seepage quality and quantity, and run-off for all components of the North Pile Facility including: <ul style="list-style-type: none"> a. monitoring locations, types of instrumentation used, and frequency of monitoring, including a site map to scale; and b. predicted performance values based on expected facility design. ii. linkages to other monitoring programs required in the Licence; and iii. v. any other information about the monitoring that will be performed to meet the objectives in Part E, Item 6 |
| iii. linkages to other monitoring programs required in the Licence; and | | De Beers recommends that this provision be removed, as it is a repeat of section (b)(i)(c) directly above. | Board Decision: Remove ii.c. above. | |
| iv. any other information about the monitoring that will be performed to | | | | |

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 AANDC Inspector's Comments – Black
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| meet the objectives in Part E, Item 6. | | | | |
| c) Information about responses to monitoring results: | | | | c) Information about responses to monitoring results: |
| i. a description of the Response Framework that will be implemented by the Licensee to link the results of monitoring to those corrective actions necessary to ensure that the objectives listed in Part E, Item 6 are met including: <ul style="list-style-type: none"> i. definitions, with rationale for Action Levels applicable to the performance of the North Pile Facility with respect to geotechnical stability, thermal characteristics, seepage quality and quantity, and run-off; and ii. for each Action Level, a description of how exceedances of the Action Level will be assessed and generally which types of actions may be taken if the Action Level is exceeded. | | | New condition See discussion in Reasons for Decision under Part E. | i. a description of the Response Framework that will be implemented by the Licensee to link the results of monitoring to those corrective actions necessary to ensure that the objectives listed in Part E, Item 6 are met including: <ul style="list-style-type: none"> a. definitions, with rationale for Action Levels applicable to the performance of the North Pile Facility with respect to geotechnical stability, thermal characteristics, seepage quality and quantity, and run-off; and b. for each Action Level, a description of how exceedances of the Action Level will be assessed and generally which types of actions may be taken if the Action Level is exceeded. |
| 3. The ARD and Geochemical Characterization Plan referred to in Part E, Item 11 shall include, but not be limited to, the following: | | | Conditions in this section are the same as those in Part E, Item 7 of MV2001L2-0002 with some minor modifications. | 3. The ARD and Geochemical Characterization Plan referred to in Part E, Item 11 shall include, but not be limited to, the following: |
| a) A characterization of all representative rock types, (geology and mineralogy of | | | Please see above. | a) A characterization of all representative |

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| typical rock units), mined or otherwise used, including the anticipated quantities of each rock type; | | | | rock types, (geology and mineralogy of typical rock units), mined or otherwise used, including the anticipated quantities of each rock type; |
| b) An assessment of the potential for acidic or alkaline drainage and for metal leaching from the kimberlite ore stockpile and North Pile both during operation and after closure; | | | Please see above. | b) An assessment of the potential for acidic or alkaline drainage and for metal leaching from the kimberlite ore stockpile and North Pile both during operation and after closure; |
| c) Description of estimated loadings and impact on receiving water chemistry and the internal contaminant loading balance from each source, and description of how results of seepage surveys will be incorporated; | | De Beers recommends changing the phrase "impact on receiving water chemistry" to "change in receiving water chemistry". "Impacts" are more appropriately addressed in the AEMP. | Board Decision: Replace wording in draft WL with that suggested by De Beers. | c) Description of estimated loadings and change in receiving water chemistry and the internal contaminant loading balance from each source, and description of how results of seepage surveys will be incorporated; |
| d) A geochemical characterization of material to be used for construction and reclamation; | | | Please see above under 3. | d) A geochemical characterization of material to be used for construction and reclamation; |
| e) A rationale describing how the sampling plan and sampled materials are representative of the materials to be mined or otherwise used; and | | | Please see above under 3. | e) A rationale describing how the sampling plan and sampled materials are representative of the materials to be mined or otherwise used; and |
| f) A description of the proposed means for preventing, monitoring, and managing | | | Please see above under 3. | f) A description of the proposed means for |

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| <p>ARD and metal leaching including a map or diagram of monitoring locations.</p> | | | | <p>preventing, monitoring, and managing ARD and metal leaching including a map or diagram of monitoring locations.</p> |
| <p>4. Seepage surveys required as per Part E, Item 13 of the Licence shall be conducted on all Waste storage areas, including the constructed kimberlite ore stockpile, the North Pile storage areas, and the Water Management Pond on the following basis:</p> | | | <p>Conditions in this section are the same as those in Part E, Item 9 of MV2001L2-0002 with some minor modifications.</p> | <p>4. Seepage surveys required as per Part E, Item 13 of the Licence shall be conducted on all Waste storage areas, including the constructed kimberlite ore stockpile, the North Pile storage areas, and the Water Management Pond on the following basis:</p> |
| <p>a) Sampling of detected seepages a minimum of twice per year (once during early summer freshet thaw and again in late summer or fall); additional monitoring should be conducted as soon as practicable following Major Storm Events;</p> | | | <p>Please see above.</p> | <p>a) Sampling of detected seepages a minimum of twice per year (once during early summer freshet thaw and again in late summer or fall); additional monitoring should be conducted as soon as practicable following Major Storm Events;</p> |
| <p>b) Each seepage survey shall include sampling at a reference location in an unaffected area:</p> | | | <p>Please see above.</p> | <p>b) Each seepage survey shall include sampling at a reference location in an unaffected area;</p> |
| <p>c) The monitoring plan shall include specific thresholds for parameters of concern to trigger additional sampling or other activities;</p> | <p>Although AANDC is not opposed to this wording, it is not consistent with other sections of the licence that reference adaptive management.</p> <p>Recommendation:</p> <p>Consider modify the wording to be</p> | <p>Please see De Beers' comment above regarding consistent terminology. De Beers recommends that the term "Action Level" be used, as opposed to "specific thresholds".</p> | <p>Board Decision: replace "specific thresholds" with "Action Levels".</p> | <p>c) The monitoring plan shall include Action Levels for parameters of concern to trigger additional sampling or other activities;</p> |

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| | consistent with other sections of the licence; e.g. action levels, response plan, etc. | | | |
| d) Testing in the field shall include measurements of field pH, temperature, flow, conductivity, and observations of the physical properties of the seepage; | | | Please see above under 4. | d) Testing in the field shall include measurements of field pH, temperature, flow, conductivity, and observations of the physical properties of the seepage; |
| e) Laboratory analysis of each sample shall include major ions, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), pH, total metals, and dissolved metals by inductively coupled plasma (ICP) mass spectrometry; and | | De Beers recommends that the phrase "by inductively coupled plasma (ICP) mass spectrometry" be removed from this provision. This technique is appropriate for metals analyses but is not used for all other parameters. | Board Decision: Delete "by inductively coupled plasma (ICP) mass spectrometry" | e) Laboratory analysis of each sample shall include major ions, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), pH, total metals, and dissolved metals; and |
| f) Results should be assessed in the context of design predictions and in conjunction with monitoring results for the thermal and hydrological performance of the containment and Water management system as part of the ARD and Geochemical Monitoring Report. | | | Please see above under 4. | f) Results should be assessed in the context of design predictions and in conjunction with monitoring results for the thermal and hydrological performance of the containment and Water management system as part of the ARD and Geochemical Monitoring Report. |
| SCHEDULE 5 | | | | |
| PART F: CONDITIONS RELATED TO WATER AND WASTEWATER MANAGEMENT | | | | |
| Board Staff notes of clarification to reviewers: <ul style="list-style-type: none"> proposed changes to requirements are based on recommendations or to be consistent with other Type A water licences | | | | |
| 1. The Water Management Plan referred to in Part F, Item 5 shall include, but not be limited to, the | | | Content of North Pile Management Plan is based | 1. The Water Management Plan referred to in Part F, Item 5 shall include, but not be limited |

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| following information: | | | on requirements listed in Part F, Item 4 of MV2001L2-0002 as well as content of existing, approved plan | to, the following information: |
| a) Information regarding Water and Wastewater management: | | | | a) Information regarding Water and Wastewater management: |
| i. a summary, with appropriate maps or diagrams, of the components of the Water management system and all the Water and Waste Water streams that report to it; | | | New condition | i. a summary, with appropriate maps or diagrams, of the components of the Water management system and all the Water and Waste Water streams that report to it; |
| ii. a description of the process and facilities intended for the purposes of obtaining fresh water from Snap Lake for use at the Snap Lake Diamond Project; | | | Based on condition Part F, Item 4 of MV2001L2-0002 | ii. a description of the process and facilities intended for the purposes of obtaining fresh water from Snap Lake for use at the Snap Lake Diamond Project; |
| iii. the process and facilities for the collection and management of surface runoff generated on site; | | | Based on condition Part F, Item 4 of MV2001L2-0002 | iii. the process and facilities for the collection and management of surface runoff generated on site; |
| iv. the process and facilities for the collection and management of any Wastewater resulting from mining activities; | | | Based on condition Part F, Item 4 of MV2001L2-0002. | iv. the process and facilities for the collection and management of any Wastewater resulting from mining activities; |

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 AANDC Inspector's Comments – Black
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| <p>v. the process and facilities for the treatment and Discharge of treated effluent from the Snap Lake Diamond Project to Snap Lake;</p> | | | <p>Based on condition Part F, Item 4 of MV2001L2-0002</p> | <p>v. the process and facilities for the treatment and Discharge of treated effluent from the Snap Lake Diamond Project to Snap Lake;</p> |
| <p>vi. details of the final hydraulic design of all Water management structures and Water balance estimates on a monthly basis for each year of the proposed Licence; and</p> | | | <p>Based on condition Part F, Item 4 of MV2001L2-0002</p> | <p>vi. details of the final hydraulic design of all Water management structures and Water balance estimates on a monthly basis for each year of the proposed Licence; and</p> |
| <p>vii. any other information required to describe how Water and Wastewater will be managed such that the objectives listed in Part F, Item 4 of the Licence will be met.</p> | | | <p>New condition</p> | <p>vii. any other information required to describe how Water and Wastewater will be managed such that the objectives listed in Part F, Item 4 of the Licence will be met.</p> |
| <p>b) Information regarding monitoring including:</p> | | | | <p>b) Information regarding monitoring including:</p> |
| <p>i. details of monitoring, including a rationale for each component of the Water management system;</p> | | | <p>Based on condition Part F, Item 4 of MV2001L2-0002. This condition includes groundwater that seeps into the underground and therefore negates the need for a separate Groundwater Quantity and Quality Monitoring Program that was previously required in Part F, Item 5 of MV2001L2-0002.</p> | <p>i. details of monitoring, including a rationale for each component of the Water management system;</p> |

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| <p>ii. linkages to other monitoring programs required in the Licence; and</p> | | | <p>New condition</p> | <p>ii. linkages to other monitoring programs required in the Licence; and</p> |
| <p>iii. any other information about the monitoring that will be performed to meet the objectives in Part F, Item 4.</p> | | | <p>New condition</p> | <p>iii. any other information about the monitoring that will be performed to meet the objectives in Part F, Item 4.</p> |
| <p>c) Information about responses to monitoring results:</p> | | | | <p>c) Information about responses to monitoring results:</p> |
| <p>i. A description of the Response Framework that will be implemented by the Licensee to link the results of monitoring to those corrective actions necessary to ensure that the objectives listed in Part E, Item 6 are met including:</p> | | | <p>New condition – see discussion in Reasons for Decision under Part F</p> | <p>i. A description of the Response Framework that will be implemented by the Licensee to link the results of monitoring to those corrective actions necessary to ensure that the objectives listed in Part F, Item 5 are met including:</p> |
| <p>a. definitions, with rationale for Action Levels applicable to the performance of the North Pile Facility with respect to geotechnical stability, thermal characteristics, seepage quality and quantity, and run-off;</p> | <p>Add an additional clause similar in nature to (a) for the Water Management Pond. Maintaining the site water balance and containment of contaminated water at the site is a priority for the operation.</p> <p>Recommendation:</p> <p>Add, "definitions, with rationale for Action Levels applicable to the performance of the Water Management Pond with respect to geotechnical stability, thermal characteristics, seepage quality and quantity, and run-off;"</p> | <p>De Beers agrees with this recommendation.</p> <p>Section (c)(i)(a) is duplicative of the requirements of the North Pile Management Plan; therefore, De Beers recommends that it be removed. If it is to be maintained, it is De Beers understanding that the plans will cross-reference each other where appropriate.</p> | <p>The language in the draft WL was mistakenly copied and pasted from the North Pile Management Plan.</p> <p>Board Decision: Adopt language suggested by AANDC</p> | <p>a. definitions, with rationale for Action Levels applicable to the performance of the Water Management Pond with respect to geotechnical stability, thermal characteristics, seepage quality and quantity, and run-off;</p> |

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| <p>b. for each Action Level, a description of how exceedances of the Action Level will be assessed and generally which types of actions may be taken if the Action Level is exceeded.</p> | | | <p>New condition required for Response Framework</p> | <p>b. for each Action Level, a description of how exceedances of the Action Level will be assessed and generally which types of actions may be taken if the Action Level is exceeded.</p> |
| <p>2. The Strontium Response Plan referred to in Part F, Item 15 shall include, but not be limited to, the following:</p> | | | | <p>2. The Strontium Response Plan referred to in Part F, Item 15 shall include, but not be limited to, the following:</p> |
| <p>a. A quantitative description of strontium sources to and forms of strontium in the effluent stream from different mine activities;</p> | <p>Recommendation: Remove the word "to" that follows strontium sources.</p> | <p>De Beers agrees with this recommendation.</p> <p>De Beers recommends that the word "quantitative" be removed from this provision as it is unclear what it would require.</p> <p>De Beers has attached a separate document containing its proposed changes to sections 2 through 4. In De Beers' view, these proposed changes incorporate all of the requirements of section 2 through 4, while providing additional clarity as well as a logical progression related to testing. For instance, in the case of strontium, the first priority is to conduct the necessary testing to remove uncertainty regarding predicted lack of toxicity in Snap Lake. If the testing indicates that toxicity could occur in future, these</p> | <p>For a full discussion about the inclusion of the Strontium Response Plan as well as a response to De Beers issues with the content of the plan can be found in the Reasons for Decision under Part F.</p> <p>We note that the amounts of strontium and sources were already modelled by Golder in the "Snap Lake Mine Site Water Quality" submitted with De Beers' renewal application in June 2011. That model did give a "quantitative" estimate of strontium from all sources; therefore, this condition only asks for existing data to be reiterated.</p> <p>Board Decision: -Leave "quantitative" in the</p> | <p>a) A quantitative description of strontium sources and forms of strontium in the effluent stream from different mine activities;</p> |

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| | | <p>results will serve to direct additional management actions. Otherwise, no further management actions will be required. In the case of TDS, where the issue is the future level at which toxicity could occur, responses are described in the TDS Management Plan (Schedule 5, Item 3).</p> | <p>condition</p> <p>-remove the word "to" as recommended by AANDC</p> | |
| <p>b. A review of potential mitigation and treatment technology to establish the feasibility and costs of reducing strontium loading to Snap Lake from the Project;</p> | | | <p>New condition, consistent with the Board's Water and Effluent Quality Management Policy objective of minimizing the amount of waste deposited to the environment.</p> | <p>b) A review of potential mitigation and treatment technology to establish the feasibility and costs of reducing strontium loading to Snap Lake from the Project;</p> |
| <p>c. Recommendations and supporting rationale for an appropriate Water quality objective for strontium in Snap Lake which is derived from toxicity testing conducted by the Licensee and/or published toxicology studies; and</p> | | | <p>New condition, noting that De Beers has already initiated this work.</p> <p>Board Decision: Capitalize Water Quality Objective</p> | <p>c) Recommendations and supporting rationale for an appropriate Water Quality Objective for strontium in Snap Lake which is derived from toxicity testing conducted by the Licensee and/or published toxicology studies; and</p> |
| <p>d. Recommendations for further actions to be taken in response to increasing levels of strontium in Snap Lake and a timeline for implementation.</p> | | | <p>New condition</p> | <p>d) Recommendations for further actions to be taken in response to increasing levels of strontium in Snap Lake and a timeline for implementation.</p> |
| <p>3. The TDS Response Plan referred to in Part F, Item 16 shall include, but not be limited to:</p> | | | <p>For a full discussion about the inclusion of the TDS Response Plan as well as a</p> | <p>3. The TDS Response Plan referred to in Part F, Item 16 shall include, but not be limited to:</p> |

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| | | | response to De Beers issues with the content of the plan can be found in the Reasons for Decision under Part F. | |
| a) A description of current TDS sources and management including: | | | | a) A description of current TDS sources and management including: |
| i. an assessment and quantification of sources of TDS loading to Minewater; | | | New condition | i. an assessment and quantification of sources of TDS loading to Minewater; |
| ii. a description of current practices for minimizing Groundwater seepage into the underground; | | | This and the condition below replace some of the requirements of Part F, Items 5 and 6 from MV2001L2-0002 | ii. a description of current practices for minimizing Groundwater seepage into the underground; |
| iii. a summary of ongoing investigations into improvements to Minewater management that would reduce TDS loadings; and | | | New condition, based on comments from De Beers that they are already working on improving minewater management. | iii. a summary of ongoing investigations into improvements to Minewater management that would reduce TDS loadings; and |
| iv. any other information necessary to describe issues related to minimizing the TDS loadings to the receiving environment. | | | New condition | iv. any other information necessary to describe issues related to minimizing the TDS loadings to the receiving environment. |
| b) A description of the ecological implications of TDS and Chloride loadings to the Receiving Environment including: | | | New condition | b) A description of the ecological implications of TDS, Chloride and Fluoride loadings to the Receiving Environment including: |

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| i. recommendations and supporting rationale for an appropriate Water quality objective for TDS and Chloride in Snap Lake derived from toxicity testing conducted by the Licensee and/or published toxicology studies; and | | | New condition. Board Decision: Capitalize Water Quality Objective. | i. recommendations and supporting rationale for an appropriate Water Quality Objective for TDS, Chloride and Fluoride in Snap Lake derived from toxicity testing conducted by the Licensee and/or published toxicology studies; and |
| ii. recommendations and rationale for EQC for TDS and Chloride, to be applied at SNP station 02-17, that would ensure protection of aquatic life in Snap Lake. | | | New condition | ii. recommendations and rationale for EQC for TDS, Chloride and Fluoride, to be applied at SNP station 02-17, that would ensure protection of aquatic life in Snap Lake. |
| c) A discussion of options for reducing the amount of TDS in the final effluent discharged to Snap Lake by, for example, grouting or otherwise reducing significant flows of connate groundwater or treating some portion of the Minewater. This discussion should include: | | | New condition, consistent with the Board's Water and Effluent Quality Management Policy objective of minimizing the amount of waste deposited to the environment. | c) A discussion of options for reducing the amount of TDS in the final effluent discharged to Snap Lake by, for example, grouting or otherwise reducing significant flows of connate Groundwater or treating some portion of the Minewater. This discussion should include: |
| i. options that would allow for the maintenance of the whole lake average of TDS at below 350 mg/L | | | New condition | i. options that would allow for the maintenance of the whole lake average of TDS at below 350 mg/L |
| ii. options that would achieve the lowest practical effluent quality criteria at the site; and | Options should include an assessment of water treatment plant enhancement or plant upgrades. | Please see attached document for De Beers' proposed changes to sections 2 through 4. | The condition does not specify what should be included as we cannot presuppose all of the options | ii. options that would achieve the lowest practical effluent quality criteria at the site; |

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| | <p>Recommendation:</p> <p>The clause should be modified to state, "ii. Options that would achieve the lowest practical effluent quality criteria at the site, including treatment plant enhancements or plant upgrades; and"</p> | | <p>and leave that to the proponent. The plan is subject to review and Board approval, so there will be an opportunity to ensure that the options considered are appropriate.</p> <p>Board Decision: Retain draft WL language.</p> | <p>and</p> |
| <p>iii. for each option, a discussion of technical feasibility, cost/benefit analyses, and any other information necessary to support recommendations made as per d) below.</p> | | | <p>New condition</p> | <p>iii. for each option, a discussion of technical feasibility, cost/benefit analyses, and any other information necessary to support recommendations made as per d) below.</p> |
| <p>d) Recommendations for improvements to Minewater management and monitoring to be implemented through the Water Management Plan and a schedule for implementation.</p> | | | <p>New condition, meant to ensure that appropriate changes to wastewater management are implemented through the Water Management Plan.</p> | <p>d) Recommendations for improvements to Minewater management and monitoring to be implemented through the Water Management Plan and a schedule for implementation.</p> |
| <p>4. The Nitrogen Response Plan referred to in Part F, Item 17 shall include, but not be limited to:</p> | | | <p>For a full discussion about the inclusion of the Nitrogen Response Plan as well as a response to De Beers issues with the content of the plan can be found in the Reasons for Decision under Part F.</p> | <p>4. The Nitrogen Response Plan referred to in Part F, Item 17 shall include, but not be limited to:</p> |
| <p>a) A description of current nitrogen (i.e., nitrate and ammonia) sources and management including:</p> | | | <p>New condition</p> | <p>a) A description of current nitrogen (i.e., nitrate and ammonia) sources and management including:</p> |

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| i. an assessment and quantification of sources of nitrogen loadings to Minewater; | | | New condition | i. an assessment and quantification of sources of nitrogen loadings to Minewater; |
| ii. a description of current practices for minimizing the amount of nitrogen in the Minewater; | | | New condition | ii. a description of current practices for minimizing the amount of nitrogen in the Minewater; |
| iii. a summary of ongoing investigations into improvements to Minewater and/or explosives management that would reduce nitrogen loadings; and | | | New condition | iii. a summary of ongoing investigations into improvements to Minewater and/or explosives management that would reduce nitrogen loadings; and |
| iv. any other information necessary to describe issues related to minimizing the nitrogen loadings to the receiving environment. | | | New condition | iv. any other information necessary to describe issues related to minimizing the nitrogen loadings to the receiving environment. |
| b) A description of the ecological implications of nitrogen loadings to the Receiving Environment including: | | | New condition | b) A description of the ecological implications of nitrogen loadings to the Receiving Environment including: |
| i. recommendations and supporting rationale for an appropriate Water quality objectives for ammonia and nitrate in Snap Lake derived from toxicity testing conducted by the Licensee and/or published toxicology studies; and | <p>Inadvertently there is a word with a strikethrough included.</p> <p>Recommendation:</p> <p>Remove the word in the final version.</p> | De Beers agrees with this recommendation. | <p>New condition</p> <p>Board Decision: -adopt AANDC's suggestion -capitalize Water Quality Objective</p> | i. recommendations and supporting rationale for appropriate Water Quality Objective for ammonia and nitrate in Snap Lake derived from toxicity testing conducted by the Licensee and/or published toxicology |

DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| | | | | studies; and |
| ii. recommendations and rationale for revised EQCs for ammonia and nitrate, to be applied at SNP station 02-17, that would ensure protection of aquatic life in Snap Lake. | | | New condition | ii. recommendations and rationale for revised EQCs for ammonia and nitrate, to be applied at SNP station 02-17, that would ensure protection of aquatic life in Snap Lake. |
| c) A discussion of options for reducing the amount of nitrogen in the final effluent discharged to Snap Lake in order to achieve the lowest practical effluent quality criteria at the site; and | | | New condition | c) A discussion of options for reducing the amount of nitrogen in the final effluent discharged to Snap Lake in order to achieve the lowest practical effluent quality criteria at the site; and |
| d) Recommendations for improvements to Minewater or explosives management and monitoring to be implemented through the Water Management Plan and a schedule for implementation. | | | New condition, meant to ensure that appropriate changes to wastewater management are implemented through the Water Management Plan. | d) Recommendations for improvements to Minewater or explosives management and monitoring to be implemented through the Water Management Plan and a schedule for implementation. |
| SCHEDULE 6 | | | | |
| PART G: CONDITIONS APPLYING TO AQUATIC EFFECTS MONITORING | | | | |
| Board Staff notes of clarification to reviewers: <ul style="list-style-type: none"> We have attempted to clarify the difference between requirements of the AEM Program from what is to be described in the AEM Program Design Plan | During the Technical Session in September 2011, De Beers intended to add monitoring stations downstream of Snap Lake, in addition to KING 01. During the community | De Beers does not believe that a requirement in the water licence to this effect is necessary; however, De Beers intends to | Details of monitoring station locations and sampling frequency etc. are to be decided within the review and | |

DFO Comments – Blue
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 AANDC Inspector's Comments – Black
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| <ul style="list-style-type: none"> We have tried to harmonize requirements, where appropriate, to those of the Fisheries Authorization as recommended; note, however, that we have also proposed changes to the requirements of the SNP to better capture some of the recommendations for licence/Fisheries Authorization harmonization other proposed changes to requirements are based on recommendations or to be consistent with other Type A water licences | <p>visit of Lutsel Ke, the community expressed to SLEMA the concern of potential mine impacts on the Lockhart River and East Arm of Great Slave Lake, and expected more monitoring for downstream of the Mine.</p> <p>Recommendation:</p> <p>Add a term and/or condition for more downstream monitoring</p> | <p>include this monitoring in the AEMP Design Plan.</p> | <p>approval of the AEMP Design Document later this year.</p> <p>Board Decision: Do not add conditions as suggested by SLEMA.</p> | |
| <p>1. Monitoring conducted under the Aquatic Effects Monitoring Program (AEMP) shall include, but not be limited to, the following:</p> | | | | <p>1. Monitoring conducted under the Aquatic Effects Monitoring Program (AEMP) shall include, but not be limited to, the following:</p> |
| <p>a) Monitoring for the purpose of measuring Project-related effects on the following components of the Receiving Environment:</p> | | | <p>Conditions below in a) are directly from conditions in Part G, Item 2b) of MV2001L2-0002 except where noted.</p> | <p>a) Monitoring for the purpose of measuring Project-related effects on the following components of the Receiving Environment:</p> |
| <p>i. water quality;</p> | | | | <p>i. water quality;</p> |
| <p>ii. sediment quality;</p> | | | | <p>ii. sediment quality;</p> |
| <p>iii. fish health;</p> | | | | <p>iii. fish health;</p> |
| <p>iv. fish population and community composition using standard methods;</p> | <p>In addition to monitoring community composition, the DFO Fisheries Act Authorization also includes recruitment</p> | <p>De Beers recommends that this provision be re-worded as follows: "fish population, recruitment, and</p> | <p>New condition to harmonize monitoring requirements with Fisheries Authorization.</p> | <p>iv. fish population, recruitment, and year class strength and community</p> |

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 AANDC Comments – Purple
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 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| | <p>and year class strength.</p> <p>Recommendation:</p> <p>Fish population monitoring should also include recruitment and year class strength in order to fully harmonize with the DFO Fisheries Act Authorization.</p> | <p>year class strength and community composition using standard methods.”</p> | <p>Board Decision: Adopt De Beers' proposed wording for this condition in final WL.</p> | <p>composition using standard methods;</p> |
| <p>v. contaminant levels in fish flesh due to changes in water quality in Snap Lake and/or the NE Lake;</p> | | | | <p>v. contaminant levels in fish flesh due to changes in Water quality in Snap Lake and/or the NE Lake;</p> |
| <p>vi. the taste of fish, to be completed with the communities, due to changes in Water quality in Snap Lake;</p> | | | | <p>vi. the taste of fish, to be completed with the communities, due to changes in Water quality in Snap Lake;</p> |
| <p>vii. The benthic invertebrate community due to changes in water or sediment quality;</p> | | | | <p>vii. The benthic invertebrate community due to changes in Water or sediment quality;</p> |
| <p>viii. the communities of zooplankton and phytoplankton due to changes in Water quality; and</p> | | | | <p>viii. the communities of zooplankton and phytoplankton due to changes in Water quality; and</p> |
| <p>ix. changes to fish habitat and its potential consequence to aquatic life in Snap Lake.</p> | | | | <p>ix. changes to fish habitat and its potential consequence to aquatic life in Snap Lake.</p> |
| <p>b) Monitoring the following as indicators of nutrient enrichment in Snap Lake:</p> | | | <p>Conditions below in b) are directly from conditions in Part G, Item 2d) of MV2001L2-0002 except</p> | <p>b) Monitoring the following as indicators of nutrient enrichment in Snap Lake:</p> |

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 AANDC Inspector's Comments – Black
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| | | | where noted. | |
| x. total phosphorus, dissolved phosphorus and orthophosphate, nitrate, nitrite, ammonia, and Kjeldahl nitrogen; and | <p>As phosphorus is the limiting factor in eutrophication of Snap Lake, the concentration and load of Total Phosphorus discharged to Snap Lake must be monitored and reported. AANDC understands that currently there is only a loading limit for Total Phosphorus (256 kg/yr). AANDC believes there would be value in developing a phosphorus loading model for Snap Lake.</p> <p>Lake eutrophication has been linked to increased bioavailability of mercury which may lead to potential mercury accumulation in fish tissues.</p> <p>Recommendation:</p> <p>The AEMP should specifically include 'reporting' on Total Phosphorus concentrations and loadings to Snap Lake.</p> | The AEMP will continue to monitor phosphorus concentrations in Snap Lake. De Beers believes that this is sufficient and that the current loading limit for phosphorus is adequate. It is not necessary at this time to develop a phosphorus loading model. | <p>There is no evidence on the renewal process record to support AANDC's recommendation at this time. A phosphorus loading model can be developed if necessary in future based on further monitoring.</p> <p>Board Decision: Do not add condition for AANDC recommendation to final WL.</p> | i. total phosphorus, dissolved phosphorus and orthophosphate, nitrate, nitrite, ammonia, and Kjeldahl nitrogen; and |
| xi. chlorophyll a and algal biomass and species composition of the phytoplankton community. | | | | ii. chlorophyll a and algal biomass and species composition of the phytoplankton community. |
| c) Monitoring to verify or assess the Environmental Assessment predictions relating to the trophic and dissolved oxygen status of Snap Lake including monitoring of: | | | Conditions below in c) are directly from conditions in Part G, Item 2e) of MV2001L2-0002 except where noted. | c) Monitoring to verify or assess the Environmental Assessment predictions relating to the trophic and dissolved oxygen status of Snap Lake including monitoring of: |
| i. dissolved oxygen concentrations in profiles at deep portions (i.e., >8 m) of Snap Lake with monitoring occurring monthly from | | | Condition updated to specify exactly how often to sample in order to harmonize | i. dissolved oxygen concentrations in profiles at deep portions (i.e., >8 m) of Snap Lake |

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 ENR Comment – Green
 AANDC Comments – Purple
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 SLEMA Comments – Grey
 AANDC Inspector’s Comments – Black
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| <p>February through May (i.e., under ice) and in late summer;</p> | | | <p>monitoring requirements with Fisheries Authorization.</p> | <p>with monitoring occurring monthly from February through May (i.e., under ice) and in late summer;</p> |
| <p>ii. deep water benthic invertebrate community, including abundance, biomass, and species diversity;</p> | | | <p>New condition added to specify exactly how often to sample in order to harmonize monitoring requirements with Fisheries Authorization.</p> | <p>ii. deep water benthic invertebrate community, including abundance, biomass, and species diversity;</p> |
| <p>iii. concentrations of total phosphorus, orthophosphate, and dissolved phosphorus in connate groundwater and mine effluent on a regular basis and in Snap Lake under ice in March and in early summer;</p> | <p>Use of a phosphorus-loading model would allow the published relationship between phosphorus-loading and primary productivity to be used to predict the effect of phosphorus-inputs on phytoplankton productivity in Snap Lake.</p> <p>Recommendation:</p> <p>DFO recommends that DBCI use a phosphorus-loading model that incorporates phosphorus-inputs and lake flushing rate.</p> | <p>Please see above.</p> <p>De Beers recommends that the reference to “connate groundwater” be removed. It is not relevant to the AEMP, which is concerned with what is entering Snap Lake, not with groundwater that remains underground.</p> | <p>Please see response re: phosphorus loading model as per 1b)i above.</p> <p>Although the condition has not been altered from the original WL, De Beers is correct that “connate groundwater” is not measured in the AEMP.</p> <p>Board Decision: Remove the words “connate groundwater and” from the condition in the final WL.</p> | <p>iii. concentrations of total phosphorus, orthophosphate, and dissolved phosphorus in mine effluent on a regular basis and in Snap Lake under ice in March and in early summer;</p> |
| <p>iv. Concentration of chlorophyll a in Snap Lake in early summer after the loss of ice cover and in midsummer; and</p> | <p>Chlorophyll samples are easy to collect and the analysis is relatively low cost. Sampling is as follows: fill a 1-L bottle pushed underwater to ~ 0.5 m, then filter water on site, fold the filter, place in a small petri dish, cover with tin foil, and freeze. Samples can accumulate and then be shipped out to a lab monthly, seasonally, or at the end of the open water period.</p> | <p>De Beers believes that this provision should remain as currently drafted. However, De Beers intends to address further monitoring in the AEMP Design Document.</p> | <p>Details of monitoring station locations and sampling frequency etc. are to be decided within the review and approval of the AEMP Design Document later this year.</p> <p>Board Decision: Do not add extra requirements to the AEMP as part of the WL. No changes from draft WL.</p> | <p>iv. Concentration of chlorophyll a in Snap Lake in early summer after the loss of ice cover and in midsummer; and</p> |

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| | <p>Recommendation:</p> <p>Measuring chlorophyll concentration at key locations throughout the period of open water is a cost effective and easy way to track a key indicator of lake health. This is especially important at Snap Lake because the lake is small and the minewater effluent contains phosphorus.</p> <p>Therefore, DeBeers should be collecting water and filtering for chlorophyll analysis at several key locations as often as is feasible.</p> | | | |
| <p>v. Algal biomass and species community composition for phytoplankton in Snap Lake in midsummer. The monitoring should include measures of cyanobacteria biomass and species composition and cyanotoxins in the event that algal community compositions shift to favour cyanobacteria.</p> | <p>Phytoplankton biomass and species assemblage are more costly than chlorophyll to measure but offer key information about the quality of pelagic fish habitat. Sampling annually is not an ideal way to track the status of fish habitat quality.</p> <p>Recommendation:</p> <p>DFO recommends that more frequent sampling of phytoplankton biomass and species assemblage be considered.</p> | <p>Please see above.</p> | <p>Details of monitoring station locations and sampling frequency etc. are to be decided within the review and approval of the AEMP Design Document later this year.</p> <p>Board Decision: Do not add extra requirements to the AEMP as part of the WL. No changes from draft WL.</p> | <p>v. Algal biomass and species community composition for phytoplankton in Snap Lake in midsummer. The monitoring should include measures of cyanobacteria biomass and species composition and cyanotoxins in the event that algal community compositions shift to favour cyanobacteria.</p> |
| <p>d) Procedures to minimize the impacts of the AEMP on fish populations and fish habitat.</p> | | | <p>Previously Part G, Item 2f) of MV2001L2-0002</p> | <p>d) Procedures to minimize the impacts of the AEMP on fish populations and fish habitat.</p> |
| <p>2. The AEMP Design Document referred to in Part G, Item 3 shall include, but not be limited to, the following:</p> | | | | <p>2. The AEMP Design Document referred to in Part G, Item 3 shall include, but not be limited</p> |

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| | | | | to, the following: |
| <p>a) A conceptual site model that describes the pathways of potential effects from the Project to the aquatic ecosystem and their relationships to the ecological characteristics within the receiving environment. The conceptual site model should be based on updated effect predictions and other information from the Aquatic Effects Re-Evaluation Report; it should also clearly define testable hypotheses for the AEMP as well as a justification of assessment and measurement endpoints;</p> | <p>AANDC notes that there were also 'Commitments' made during the EA and original Water Licensing Process. These commitments should also be considered when designing an AEMP for the project.</p> <p>Recommendation:</p> <p>AANDC recommends that the conceptual site model for the AEMP Design Document also consider 'EA Commitments'.</p> | <p>It is unclear what "EA Commitments" this recommendation is referring to and how they are relevant to the conceptual site model. De Beers does not agree with this recommendation, as it will lead to confusion.</p> | <p>AANDC's comments are not clear. More information is needed regarding what 'commitments' are being referred to.</p> <p>Board Decision: Leave condition as is since it is not clear what exactly AANDC is referring to.</p> | <p>a) A conceptual site model that describes the pathways of potential effects from the Project to the aquatic ecosystem and their relationships to the ecological characteristics within the receiving environment. The conceptual site model should be based on updated effect predictions and other information from the Aquatic Effects Re-Evaluation Report; it should also clearly define testable hypotheses for the AEMP as well as a justification of assessment and measurement endpoints;</p> |
| <p>b) A description of the AEMP sampling and analysis plan required to satisfy the objectives of Part G, Item 1 and incorporate the specific monitoring requirements listed in Schedule 6, Item 1. The sampling and analysis plan shall include:</p> | | | | <p>b) A description of the AEMP sampling and analysis plan required to satisfy the objectives of Part G, Item 1 and incorporate the specific monitoring requirements listed in Schedule 6, Item 1. The sampling and analysis plan shall include:</p> |
| <p>i. the variables, sample media, monitoring protocols, and Quality Assurance/Quality Control (QA/QC) procedures;</p> | | | <p>Update of Part G, Item 2) from MV2001L2-0002.</p> | <p>i. the variables, sample media, monitoring protocols, and Quality Assurance/Quality Control (QA/QC) procedures;</p> |

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| <p>ii. statistical design criteria, including a description of sampling frequencies for each parameter that ensure both accurate characterization of short-term variability, the collection of sufficient data to establish long-term trends, and a method to conduct trend analysis;</p> | | | <p>Previously Part G, Item 2m) from MV2001L2-0002.</p> | <p>ii. statistical design criteria, including a description of sampling frequencies for each parameter that ensure both accurate characterization of short-term variability, the collection of sufficient data to establish long-term trends, and a method to conduct trend analysis;</p> |
| <p>iii. a description of procedures to analyze and interpret data collected for each component including a procedure to integrate the results of individual monitoring components such as a weight-of-evidence analysis;</p> | | | <p>Update of Part G, Item 2n) from MV2001L2-0002 which includes the weight-of-evidence analysis meant to integrate the data better. This is based on recommendations and commitments from De Beers.</p> | <p>iii. a description of procedures to analyze and interpret data collected for each component including a procedure to integrate the results of individual monitoring components such as a weight-of-evidence analysis;</p> |
| <p>iv. the QA/QC procedures which will ensure that any future changes in monitoring protocols will be calibrated to initial monitoring protocols and data sets so that continuity, consistency, validity, and applicability of monitoring results will be maintained. This program shall also explicitly describe the measures that will be taken to identify and address any information deficiencies;</p> | | | <p>Previously Part G, Item 2o) from MV2001L2-0002.</p> | <p>iv. the QA/QC procedures which will ensure that any future changes in monitoring protocols will be calibrated to initial monitoring protocols and data sets so that continuity, consistency, validity, and applicability of monitoring results will be maintained. This program shall also explicitly describe the measures that will be taken to identify and address any information deficiencies;</p> |

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| <p>v. a complete description of how the Sampling Plan for TDS, Calcium and Chloride, as approved under licence MV2001L2-0002 has been incorporated into the AEMP;</p> | | | <p>This condition replaces the requirement for a standalone TDS sampling plan previously required under Part F, Item 12 of MV2001L2-0002; this sampling plan was always conducted and reported under the AEMP and now that has been formalized.</p> | <p>v. a complete description of how the Sampling Plan for TDS, Calcium and Chloride, as approved under licence MV2001L2-0002 has been incorporated into the AEMP;</p> |
| <p>vi. a description of how relevant SNP monitoring will be incorporated into the AEMP; and</p> | | | <p>New condition to be consistent with other water licences.</p> | <p>vi. a description of how relevant SNP monitoring will be incorporated into the AEMP; and</p> |
| <p>vii. a description of the area to be monitored including maps showing all sampling and reference locations as well as the overall predicted zone of influence of the Project (i.e., predicted zone of influence of mining operations, mineral exploration, or any other disturbance activities).</p> | | | <p>Previously Part G, Item 2g) from MV2001L2-0002.</p> | <p>vii. a description of the area to be monitored including maps showing all sampling and reference locations as well as the overall predicted zone of influence of the Project (i.e., predicted zone of influence of mining operations, mineral exploration, or any other disturbance activities).</p> |
| <p>c) A description of the approaches to be used to evaluate and adjust the AEMP;</p> | | | <p>Previously Part G, Item 2i) from MV2001L2-0002.</p> | <p>c) A description of the approaches to be used to evaluate and adjust the AEMP;</p> |
| <p>d) A summary of how Traditional Knowledge has been collected and incorporated into the AEMP, as well as a summary of how Traditional Knowledge will be incorporated into further</p> | | | <p>Previously Part G, Item 2p) from MV2001L2-0002.</p> | <p>d) A summary of how Traditional Knowledge has been collected and incorporated into the AEMP, as well as a summary of how Traditional Knowledge will be incorporated</p> |

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| studies relating to the AEMP; | | | | into further studies relating to the AEMP; |
| <p>e) A description of an AEMP Response Framework that will link the results of the AEMP to those actions necessary to ensure that Project-related effects on the Receiving Environment remain within an acceptable range. The Response Framework shall include:</p> | <p>AANDC notes that there were also Commitments made during the EA and original Water Licensing Process. These commitments should also be considered when assessing effects from the project.</p> <p>Recommendation:</p> <p>Consider rewording this clause to state, "A description of an AEMP Response Framework that will link the results of the AEMP to those actions necessary to ensure that Project-related effects on the Receiving Environment remain within an acceptable range and any project Commitments."</p> | Please see above. | <p>The term "acceptable range" is used to encompass all possible context for what are or are not acceptable changes to the environment. Commitments made by the proponent during the EA may be part of this context but this will have to be decided during the review and approval process.</p> <p>Board Decision: Retain draft WL language.</p> | <p>e) A description of an AEMP Response Framework that will link the results of the AEMP to those actions necessary to ensure that Project-related effects on the Receiving Environment remain within an acceptable range. The Response Framework shall include:</p> |
| <p>i. definitions, with rationale, for Significance Thresholds and tiered Action Levels applicable to the aquatic Receiving Environment of the Project; and</p> | | <p>See De Beers' comment above relating to removal of the reference to "Significance Thresholds".</p> <p>De Beers recommends that this provision be re-worded as follows:</p> <p>"identification of tiered Action Levels applicable to the aquatic Receiving Environment of the Project".</p> | <p>See response under the definition of "Significance Threshold".</p> <p>Board Decision: Retain draft WL language.</p> | <p>i. definitions, with rationale, for Significance Thresholds and tiered Action Levels applicable to the aquatic Receiving Environment of the Project; and</p> |
| <p>ii. for each Action Level:</p> <p>a. a description of the rationale including, but not limited to, a consideration of the predictions and conclusions of the Environmental Assessment as well as</p> | | De Beers recommends that the word "of" be inserted after the words "general description" in (ii)(c). | Board Decision: Adopt De Beers recommendation. | <p>ii. for each Action Level:</p> <p>a. a description of the rationale including, but not limited to, a consideration of the predictions and conclusions of the Environmental</p> |

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| <p>AEMP results to date;</p> <p>b.a description of how exceedences of Action Levels will be assessed; and</p> <p>c. a general description what types of actions may be taken if an Action Level is exceeded.</p> | | | | <p>Assessment as well as AEMP results to date;</p> <p>b. a description of how exceedences of Action Levels will be assessed; and</p> <p>c. a general description of what types of actions may be taken if an Action Level is exceeded.</p> |
| <p>f) A description of the Annual AEMP Report format;</p> | | | <p>New condition</p> | <p>f) A description of the Annual AEMP Report format;</p> |
| <p>g) A plain language description of the program objectives, methodology, and interpretative framework; and</p> | | | <p>New condition</p> | <p>g) A plain language description of the program objectives, methodology, and interpretative framework; and</p> |
| <p>h) A summary of changes to AEMP design since the last approved design and a rationale for the changes.</p> | | | <p>New condition</p> | <p>h) A summary of changes to AEMP design since the last approved design and a rationale for the changes.</p> |
| <p>3. The Aquatic Effects Re-evaluation Report referred to in Part G, Item 6 shall include, but not be limited to, the following:</p> | | <p>Please see De Beers' comment above regarding amalgamating the Re-Evaluation Report and the AEMP Design Plan.</p> | <p>Please see above as well as the Reasons for Decision, Part G, for a discussion of the issue brought up by De Beers.</p> | <p>3. The Aquatic Effects Re-evaluation Report referred to in Part G, Item 6 shall include, but not be limited to, the following:</p> |

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| <p>a) A review and summary of AEMP data collected to date including a description of overall trends in the data and other key findings of the monitoring program;</p> | | | <p>New condition, for consistency with other Type A water licences.</p> | <p>a) A review and summary of AEMP data collected to date including a description of overall trends in the data and other key findings of the monitoring program;</p> |
| <p>b) An analysis that integrates the results of individual monitoring components (e.g., Water quality, sediment, fish health, etc.) to date and describes the overall ecological significance of the results;</p> | | | <p>New condition, for consistency with other Type A water licences.</p> | <p>b) An analysis that integrates the results of individual monitoring components (e.g., Water quality, sediment, fish health, etc.) to date and describes the overall ecological significance of the results;</p> |
| <p>c) A comparison of measured Project-related aquatic effects to predictions made during the Environmental Assessment and an evaluation of any differences and lessons learned;</p> | | | <p>Based on condition in Part G, Item 2k) of MV2001L2-0002.</p> | <p>c) A comparison of measured Project-related aquatic effects to predictions made during the Environmental Assessment and an evaluation of any differences and lessons learned;</p> |
| <p>d) Updated predictions of Project-related aquatic effects or impacts from the time of writing to the end of mine life based on AEMP results to date and any other relevant operational monitoring data;</p> | | | <p>New condition, deemed necessary to facilitate adaptive management</p> | <p>d) Updated predictions of Project-related aquatic effects or impacts from the time of writing to the end of mine life based on AEMP results to date and any other relevant operational monitoring data;</p> |
| <p>e) A plain language summary of the major results of the above analyses and a plain language interpretation of the significance of those results to local people;</p> | | <p>De Beers requests clarification on the meaning of "a plain language interpretation of the significance of those results to local people". De Beers will provide a plain</p> | <p>New condition based on requests made at the Technical Session by some parties and commitments</p> | <p>e) A plain language summary of the major results of the above analyses and a plain language interpretation of the significance</p> |

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| | | language interpretation of the significance of the results, but the “local people” aspect is unclear. De Beers recommends removing the words “to local people”. | from De Beers. Board Decision: Remove the term local people. | of those results; |
| f) Recommendations, with rationale, for changes to Action Levels; | | | New condition | f) Recommendations, with rationale, for changes to Action Levels; |
| g) Recommendations, with rationale, for changes to any aspect of the AEMP Design Document; and | | | New condition | g) Recommendations, with rationale, for changes to any aspect of the AEMP Design Document; and |
| h) Any other information required to meet the objectives listed in Part G, Item 3 or as requested by the Board. | | | New condition | h) Any other information required to meet the objectives listed in Part G, Item 3 or as requested by the Board. |
| 4. The AEMP Annual Report referred to in Part G, Item 7 shall include, but not be limited to, the following: | Part 1, 2 & 3 of this Schedule make reference to EA comparisons however this section makes no mention of these comparisons being reported as part of the Annual AEMP Report. Recommendation: The Annual AEMP Report should include comparisons of existing conditions or effects from the monitoring program to EA predictions. | The AEMP already requires comparisons of existing conditions to be made to EA predictions. This will be reported on in the Annual Report, as per previous Annual Reports. The proposed recommendation is therefore redundant. | There is a condition below in e) that requires reporting of Project related effects which will, as in previous years, be reported in reference to EA predictions. Board Decision: Do not adopt AANDC recommendation. | 4. The AEMP Annual Report referred to in Part G, Item 7 shall include, but not be limited to, the following: |
| a) A plain language summary of the major results obtained in the preceding calendar year and a plain language interpretation of the significance of those results to local | | Please see De Beers comment above regarding clarification on the meaning of the “local people” portion of this provision. De | New condition based on requests made at the Technical Session by some parties and commitments | a) A plain language summary of the major results obtained in the preceding calendar year and a plain language interpretation of |

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 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| people; | | Beers recommends removing the words "to local people". | from De Beers. Board Decision: Remove term 'local people' | the significance of those results; |
| b) A summary of activities conducted under the AEMP; | | | Previously Part G, Item 7a) of MV2001L2-0002 | b) A summary of activities conducted under the AEMP; |
| c) An update of the project development activities and any accidents, malfunctions, or spills within the report time frame that could influence the results of the AEMP; | | | Previously Part G, Item 7b) of MV2001L2-0002 | c) An update of the project development activities and any accidents, malfunctions, or spills within the report time frame that could influence the results of the AEMP; |
| d) Tabular summaries of all data and information generated under the AEMP in an electronic and printed format acceptable to the Board; | | | Previously Part G, Item 7c) of MV2001L2-0002 | d) Tabular summaries of all data and information generated under the AEMP in an electronic and printed format acceptable to the Board; |
| e) An interpretation of the results, including an evaluation of any identified environmental effects that occurred as a result of the Project; | <p>While it will likely be included in the interpretation, trends over time should be identified in this condition.</p> <p>Recommendation:</p> <p>Include trends over time as part of the interpretation of results. DFO recognizes that this is included as a condition of the Re-evaluation report.</p> | An analysis of trends over time has been, and will continue to form part of interpreting the results. Therefore, De Beers does not consider it necessary to include an additional provision. | <p>Previously Part G, Item 7d), e), and h) of MV2001L2-0002.</p> <p>Trend analysis has been part of the annual reports to date and does not introduce an extra requirement. However, what exact monitoring components require trend analysis is best discussed during the review and approval of the AEMP Design Document.</p> <p>Board Decision: Retain draft</p> | e) An interpretation of the results, including an evaluation of any identified environmental effects that occurred as a result of the Project; |

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| | | | WL language | |
| | <p>This interpretation should include trend analyses.</p> <p>Recommendation:</p> <p>AANDC recommends that this clause be update to include trend analyses as part of the general year to year interpretation.</p> | Please see above. | Please see above. | |
| f) An analysis that integrates the results of individual monitoring components collected in a calendar year and describes the ecological significance of the results; | | | New condition based on discussions at the Technical sessions about integrating the results by a weight-of-evidence analysis. | f) An analysis that integrates the results of individual monitoring components collected in a calendar year and describes the ecological significance of the results; |
| g) A comparison of monitoring results to Action Levels as set in the AEMP Design Plan; | <p>The comparison should be to both EA prediction and Action Levels. This would be consistent with Part 1, 2 & 3 of this Schedule.</p> <p>Recommendation:</p> <p>AANDC recommends that this clause be update to comparisons to EA Predictions as well as Action Levels.</p> | De Beers does not agree with this recommendation as it would create duplication. EA predictions will be considered in setting Action Levels where appropriate. | <p>New condition necessary for Response Framework. Agree that EA predictions have been considered throughout and, as discussed above, condition e) also covers this comparison.</p> <p>Board Decision: Retain draft WL language.</p> | g) A comparison of monitoring results to Action Levels as set in the AEMP Design Plan; |
| h) An evaluation of the overall effectiveness of the AEMP to date; | | | Previously Part G, Item 7f) of MV2001L2-0002 | h) An evaluation of the overall effectiveness of the AEMP to date; |
| i) Recommendations for refining AEMP and the overall Environmental Management System to improve their effectiveness as required; and | | The term Environmental Management System is not defined or used elsewhere in the Licence; therefore, De Beers recommends that it be removed | <p>Previously Part G, Item 7g) of MV2001L2-0002.</p> <p>Wording is from the original licence, but as De Beers</p> | i) Recommendations for refining the AEMP to improve its effectiveness as required; and |

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| | | from this provision. | <p>points out the term "Environmental Management System" is not defined nor used elsewhere in the WL.</p> <p>Board Decision: Remove the term from the condition as suggested.</p> | |
| j) Any other information specified in the approved AEMP Design Plan or that may be requested by the Board before November 1 of any year. | | | New condition for consistency with other Type A water licences. | j) Any other information specified in the approved <i>AEMP Design Plan</i> or that may be requested by the Board before November 1 of any year. |
| 5. The AEMP Response Plan referred to in Part G, Item 8 shall contain the following information for each parameter that has been reported in the AEMP Annual Report to have exceeded an Action Level: | <p>It needs to be clear that the analysis conducted under Clause 5 (a-e) is in relation to an exceedance of an Action Level, not a Significance threshold, but that ecological implications of the Action Level exceedance must still be determined. It cannot be simply dismissed as it falls under a significance threshold.</p> <p>Recommendation:</p> <p>If this is not the intent of items under Clause 5 (a-e), revise accordingly.</p> | <p>See De Beers' comment above relating to removal of the reference to "Significance Thresholds".</p> <p>De Beers' recommends that the phrase "in the AEMP Annual Report" be removed in light of De Beers' comment above regarding reporting an Action Level exceedance.</p> | <p>All the following conditions are new and based on the Board's draft guidelines for the Response Framework.</p> <p>AANDC is correct that the conditions were meant to ensure that "ecological implications" etc. were described upon exceeding an Action Level regardless of how close this level is to the significance threshold.</p> <p>See Discussion under the definition of Significance Threshold for a response to De Beers' concern.</p> | 5. The AEMP Response Plan referred to in Part G, Item 8 shall contain the following information for each parameter that has been reported in the <i>AEMP Annual Report</i> to have exceeded an Action Level: |
| a) A description of the parameter, its relation to Significance Thresholds and the ecological | | See De Beers' comment above relating to removal of the | Board Decision: Add "Action Level" before the word | a) A description of the parameter, its relation to Significance Thresholds and the |

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| implication of the exceedance; | | reference to "Significance Thresholds". De Beers recommends that that the phrase "its relation to Significance Thresholds" be removed from this provision. | "exceedance" as per AANDC's concern above. | ecological implication of the Action Level exceedance; |
| b) A summary of how the exceedance was determined and confirmed; | | | Board Decision: Add "Action Level" before the word "exceedance" as per AANDC's concern above. | b) A summary of how the Action Level exceedance was determined and confirmed; |
| c) A description of likely causes of the exceedance and potential mitigation options if appropriate; | | | Board Decision: Add "Action Level" before the word "exceedance" as per AANDC's concern above. | c) A description of likely causes of the Action Level exceedance and potential mitigation options if appropriate; |
| d) A description of actions to be taken by the Licensee in response to the exceedance including: | | | Board Decision: Add "Action Level" before the word "exceedance" as per AANDC's concern above. | d) A description of actions to be taken by the Licensee in response to the Action Level exceedance including: |
| i. a justification of the selected action which may include a cost/benefit analysis; | | | | i. a justification of the selected action which may include a cost/benefit analysis; |
| ii. a description of timelines to implement the proposed actions, | | | | ii. a description of timelines to implement the proposed actions; |
| iii. a projection of the environmental response to the planned actions, if appropriate; | | | | iii. a projection of the environmental response to the planned actions, if appropriate; |
| iv. a monitoring plan for tracking the response to the actions, if | | | | iv. a monitoring plan for tracking the response to the actions, if appropriate; |

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| appropriate; and | | | | and |
| v. A schedule to report on the effectiveness of actions and to update the Response Plan as required. | | | | v. A schedule to report on the effectiveness of actions and to update the <i>AEMP Response Plan</i> as required. |
| e) Any other information necessary to assess the response to an Action Level exceedance or that has been requested by the Board. | | | | e) Any other information necessary to assess the response to an Action Level exceedance or that has been requested by the Board. |
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| Surveillance Network Program (SNP) Annexed to the Licence | | | | |
| The SNP has been attached to this table. Please provide any comments on the attached SNP report in this section. | <p>Station 02-17 suggests that only metals that have an EQC need be reported every six (6) days. However, all metal data should be provided as they are available at no extra cost to the company when the subset of metals is analyzed.</p> <p>Recommendation:</p> <p>Station 02-17 should include reporting of all metals data available from the ICP-MS Scan as the results are provided at no extra cost to the company.</p> | De Beers does not disagree with this recommendation and will supply these data to interested parties on request. | Since all metals will be provided monthly there is no clear benefit to providing all the metals every 6 days. Monthly is sufficient for non-EQC metals. In addition, if anyone requires them more frequently then they must submit a request to De Beers. | Board Decision: No changes to the WL |
| <p>Board Staff notes of clarification to reviewers:</p> <ul style="list-style-type: none"> We have proposed changes to the requirements of sampling at 02-24 to provide harmonization with the Fisheries Authorization as per recommendations | DFO appreciates that the WLWB has added TDS sampling at the fish habitat compensation sites and agrees that more frequent reporting of results is needed for | TDS and other monitoring will be linked to appropriate Action Levels in the AEMP Response Framework, which is part of the | Agree with De Beers' response to DFO comment. | Board Decision: No changes |

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| <ul style="list-style-type: none"> • Have proposed clarifications to sampling locations of SNP 02-18 • Have proposed clarification of how to calculate TDS Whole Lake Average (in section D) as per De Beers' response to IRs after the Technical Sessions • other proposed changes to requirements are based on recommendations or to be consistent with other Type A water licences | <p>it to be effective as an early warning of increased TDS levels.</p> <p>Recommendation:</p> <p>TDS monitoring at these sites should be linked to the AEMP response plan with appropriate trigger and action levels (e.g. develop mitigation after three consecutive hits of TDS above 350 mg/L)</p> | <p>AEMP Design Plan. Exact details of these Action Levels will be contained in the approved AEMP Design Plan following appropriate review. No changes to the Licence are required.</p> | <p>to WL.</p> | |
| | <p>The condition for sampling frequency currently states that samples should be taken at discrete 1 m depth. This should be depth intervals.</p> <p>Recommendation:</p> <p>Change to 1 metre depth intervals.</p> | <p>De Beers agrees with this recommendation.</p> | <p>Board Decision: Adopt DFO's recommendation.</p> | |
| | <p>The Department of Environment and Natural Resources has reviewed the draft water licence at reference based on its mandated responsibilities under the <i>Environmental Protection Act</i>, the <i>Forest Management Act</i>, the <i>Forest Protection Act</i> and the <i>Wildlife Act</i> and has no comments or recommendations at this time.</p> | | | |
| | <p>Station 02-18 incorrectly references water licence Section D, Item 2.</p> <p>To be consistent with the EA (TDS average @ 2000m), the whole lake average TDS concentration should be measured at SNAP 03, SNAP05, SNAP06, SNAP11A, SNAP09, SNAP12, SNAP26 and SNAP28.</p> | <p>The draft Water License refers to SNAP 02-18 in Section F, Item 13, and notes that calculation of the whole-lake TDS average is described in the SNP. Section A, Item 1 of the SNP Annex, has a table for Station SNP 02-18 that lists the parameters to be monitored and their sampling</p> | <p>De Beers is correct the reference to section D 2 is at the bottom of the SNP itself, not in the main body of the licence. No change required.</p> <p>The whole lake average that has been used to date is for the 15 sites listed in the SNP. Contained within these 15</p> | |

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| | <p>Recommendation:</p> <p>Station 02-18 should reference water licence Section F, Item 13.</p> <p>Whole Lake Average TDS Concentrations should be based on SNAP 03, SNAP05, SNAP06, SNAP11A, SNAP09, SNAP12, SNAP26 and SNAP 28.</p> | <p>frequency, and lists the 15 stations that are to be used for calculating whole-lake average TDS concentration. Within that table in the SNP Annex there is also a reference to "Section D.2", which is located in the SNP Annex and not in the Water License. No changes are required the draft Water Licence.</p> <p>The 8 stations referred to in AANDC's recommendation are a subset of the 15 stations listed in the SNP Annex, and correspond to the near-field and mid-field stations currently monitored under the AEMP water quality component. As noted above, the 15 stations to be used for calculating whole-lake average TDS concentration are already listed in the draft Licence SNP.</p> | <p>sites are the 8 sites that AANDC feel should be monitored based on the EA. The 8 sites recommended by AANDC represent the 'near field sites'. It seems to be well within the intent of the EA that the whole lake average is to include the average of the sites in the whole lake (excluding the northwest arm). Furthermore, Ecometrix's modeling indicated a general lack of a spatial gradient in Snap Lake for parameters such as TDS.</p> <p>Board Decision: No change. Keep the 15 sites</p> | |
| | <p>AANDC understands that the board is considering IL6 ditch and would suggest that if approved an additional SNP station be considered for the ditch (spilled water catchment).</p> <p>Recommendation:</p> <p>Consider including a SNP station for the IL6 ditch.</p> | <p>De Beers has agreed to establish a seepage monitoring point for the duration of construction of the IL6 ditch between the ditch and the lake.</p> | <p>The additional station can be added at a later date when there is more evidence to do so.</p> <p>Board Decision: No changes to SNP at this time.</p> | |
| | <p>Maps for SNP stations are needed for further discussion</p> | | <p>Maps will be added to the SNP that are already being used in the monthly report.</p> | |
| <p><u>SNP 02-10</u> SNP 02-10 refers to any other points where observable</p> | <p>Within the last 14 months there were 8 spills within the North Pile footprint, and more</p> | <p>De Beers agrees with this</p> | <p>This was not presented in an intervention or as part of the</p> | |

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| <p>flow to Snap Lake or Inland Lake 5 (IL5) is observed.</p> | <p>seriously, in two of the events, process water spilled from the East Cell to Snap Lake in October 2011. SLEMA issues a letter and provided recommendations on December 6, 2011. One of the recommendations is as follows:</p> <p><i>“Bog stations between the East Cell and Snap Lake shoreline of the Aquatic Effects Monitoring Program (AEMP)* are important for timely seepage control of the East Cell. It is recommended to enhance field monitoring in these stations and add them into the Surveillance Network Program (SNP). Specific conductivity, pH and turbidity should be measured daily if applicable.”</i></p> <p>* A mistake here. These stations are not part of AEMP, instead, they are Acid Rock Drainage (ARD) and Geochemistry sample locations.</p> <p>Inland Lake 6 (IL6) will be used as a water management sump after the IL6 ditch is built, then one monitoring station between the shoreline and IL6 should be established to detect any possible seepage from IL6 to Snap Lake.</p> <p>Recommendation:</p> <p>It is recommended again that the MVLWB put these bog stations into the Surveillance Network Program, especially under the umbrella of SNP 02-10.</p> <p>It is recommended that the MVLWB put this station and any other future monitoring stations between the West Cell and shoreline into the Surveillance Network Program, especially under the umbrella of SNP 02-10.</p> <p><u>See attached figure for SNP 02-10 Sub-stations</u></p> | <p>recommendation.</p> | <p>hearing.</p> <p>Since it is part of the SNP changes can be made fairly easily. Therefore there is no real urgency.</p> <p>Board Decision: No change</p> <p>Note: Once the licence is approved, the proposed changes to the SNP based on IL-6 and proposed east cell site (SLEMA's recommendation) can be sent out for review, ensuring everyone has proper input.</p> | |
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| <u>TDS Reporting</u> | <p>The monitoring program requires quarterly reporting of the whole lake average concentration of TDS at SNP 02-18 and a graph showing trends against the compliance limit (350 mg/L) (Annex Section D, item 1.a). SLEMA agrees with the requirement and believe it is an improvement, as it helps stakeholders understand the water quality change in Snap Lake in a timely manner.</p> <p>However, <u>the annual reporting of TDS forecasting</u> appears to be removed from the draft Water Licence. Current SNP under Water Licence MV2001L2-0002 has that requirement (Annex Section E, Item 2.a.iv).</p> | De Beers agrees with this recommendation. | <p>Agree with SLEMA that it was an oversight.</p> <p>Board Decision: Add annual TDS forecasting condition back into the draft (with slight change to wording), as per SLEMA recommendation.</p> | |

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| <p>The map shows the layout of the SNP 02-10 sub-stations. Key features include the North Pile Footprint, West Cell, East Cell, Starter Cell, and Landfarm. Treatment stations are marked with red dots and labels: Bog PS5 North, Bog TS2 Northwest, TS3, SP06-04, SP06-05, TS4, and SP1. A dashed line indicates the layoutdown area.</p> | <p>SNP 02-10 Sub-stations</p> <p><u>For West Cell</u> <u>For Inland Lake 6</u> <u>For East Cell</u></p> <p>Recommendation: It is recommended that the MVLWB still maintain that requirement in the new SNP.</p> | <p>Please see above.</p> | <p>Board Decision: No change</p> <p>Note: Once the licence is approved, the proposed changes to the SNP based on IL-6 and proposed east cell site (SLEMA's recommendation) can be sent out for review, ensuring everyone has proper input.</p> | |
| | <p>Significant volumes of spills of Hydraulic oil are occurring (8200 & 11,500 L in the last 2 months). I'm not sure if extractable petroleum hydrocarbon requirements for 02-01 would capture that (I'm told it'd be in the F4 fraction, and SNP reports only report on F1/F2).</p> | <p>Spills in the underground are tracked, recorded, and reported to the Inspector. No changes to the Licence are required.</p> | <p>Not enough evidence was provided for this topic,</p> <p>Board Decision: No change. Due to the fact that insufficient information was provided to make a change on this topic.</p> | |
| | <p>SNP 02-01. Rationale for nutrient sampling. Inspector supports this requirement, as it should provide data to enable managers to monitor the effectiveness of Ammonia/Nitrate wastage</p> | | <p>See above</p> | |

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| | <p>(hence, input effective source control of Nitrate & prevent it from entering the water in the underground).</p> <p>Recommendation:</p> <p>Ensure the WL criteria are in place to effectively track hydraulic oil spills in the underground. That may mean reporting on F4 fraction.</p> | | | |
| | <p>SNP 02-03. Golder (2010) noted that <i>“Water samples should be collected from this location, if possible, to determine if the composition that water at this location is representative of site runoff. Such data provides valuable information about the geochemical stability/ rate of weathering of rock used for construction at the site”</i>.</p> <p>Recommendation:</p> <p>Add <i>“provide information about the geochemical stability/rate of weathering of the rock used for construction at the site”</i> to the rationale.</p> | De Beers agrees with this recommendation. | Board Decision: Inspector's recommendation added | |
| | <p>SNP 02-07. Add 3 new SNP stations which monitor runoff from the Bulk Nitrate Storage Building (02-07.4, 02-07.5, 02-07.6).</p> <p>Recommendation:</p> <p>SNP 02-07. Add 3 new SNP station locations which monitor runoff from the Bulk Nitrate Storage Building (02-07.4, Pond Southeast of B.N.S.; 02-07.5, Pond East of B.N.S.; 02-07.6, Pond North of</p> | De Beers agrees with this recommendation. | <p>This relates to ongoing issue with the nitrate storage and the new storage facility.</p> <p>Board Decision: No change</p> <p>Note: As above changes to the SNP can all be done once the licence is approved, in order to ensure that everyone has a chance</p> | |

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| | B.N.S.). | | to provide input. | |
| | <p>SNP 02-07 (all substations) and 02-09 (all substations). Sampling data from standing water in these areas, throughout the open water period (not just freshet or heavy rainfall) is valuable for determining seasonal changes in AN-related runoff.</p> <p>Recommendation:</p> <p>Expand the description to include "uncontrolled surface runoff and standing water at the road to the Bulk Emulsion Plant & the tundra in the area of the Bulk Nitrate Storage Building.</p> | De Beers agrees with this recommendation. | Board Decision: accept change | |
| | <p>Recommendation:</p> <p>Add to location 02-09.2 (Pond downslope + NNE from AN Pad); 02-09.3 (Pond downslope & NNW of AN Pad); 02-09.4 (base of AN Pad Sump, S of AN Pad); 02-09.5 (Pond downslope of AN Pad).</p> | De Beers agrees with this recommendation. | <p>Board Decision: No change</p> <p>Note: As above changes to the SNP can all be done once the licence is approved, in order to ensure that everyone has a chance to provide input.</p> | |
| | <p>YKDFN could find no reference to the company's emission and deposition of Persistent Organic Pollutants. The incinerator at site had been exceeding guidelines for some time, with little reaction from the company. YKDFN wanted a special study to establish the local baseline, so that the contribution from the future operation of the incinerator, especially if operated with continued poor practice, can be evaluated not just in terms of stack testing, but in terms of deposition to the surrounding waters. We ask the Board to</p> | <p>For the reasons given during the Hearing process, and in particular at the Technical Sessions and in the water licence reviewer comment table, De Beers believes that this recommendation is not necessary or warranted. De Beers committed at the Technical Sessions in September 2011 to work with GNWT and Environment Canada to finalize the Incinerator Management Plan,</p> | <p>Insufficient evidence was provided to the Board on this topic.</p> | |

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| | include this as a special study. | which is in line with control at source. | | |
| | YKDFN advocated that the Board should provide clear feedback on the company response re: INAC's position that changes from background impact the water quality and future use. To our knowledge, this has not been done. | This comment is directed at the Board. | It is unclear what position of INAC's that is being referred to. | |
| | YKDFN feel that the Adaptive Management changes have the potential to be positive, so long as the company and the Boards take steps to ensure that the communities have appropriate support to participate and understand the matters. Increasing use of risk assessment and weight of evidence move away from objective targets – with a corresponding increase in complexity. Without careful collaboration, this approach could leave communities unable to understand why and how their waters are being impacted. – For clarity, the current level of support is insufficient to meet these needs. | De Beers acknowledges that information provided in a regulatory context is often technical and complex. Through ongoing engagement with communities, which can occur in a variety of ways, the company works to help communities understand the impact of our mining activities and the steps we are taking to minimize the impacts. De Beers remains committed to working with communities to build understanding. | Changes have been made to the AEMP reporting requirements to support plain language interpretations of the data. | |
| De Beers' comments on the SNP: <u>Specific Comments</u> 1. Page 1 of 16, Section A, Item 1, SNP 02-01 - There are a number of comments regarding the specifications for weekly and monthly monitoring of selected parameters that apply here as well as to other SNP stations listed in this Annex. a. TDS, chloride and calcium are to be monitored weekly, whereas "major ions" are to be monitored monthly. The method to be used for TDS analysis is not specified. TDS can be determined by gravimetric measurement, which has been deemed unreliable for Snap Lake and is not the method used for reporting TDS data by De | | | | |

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| <p>Beers, or it can be determined by measuring the concentrations of the ionic constituents and then using a standard formula to calculate the TDS concentration from those data. The "major ion" measurement listed under weekly monitoring covers analysis of the ions that make up TDS. However, it is not clear whether the weekly TDS measurements would be done by the same method, or gravimetrically. De Beers will continue to report both measurements but only use the calculated value in the assessment. Recommendation: that both measurements of TDS be reported but that only the calculated value be used in the assessment.</p> <p>b. Clarify that the ICP-MS scan is for total and dissolved metals (currently it just states "total and dissolved"). Total arsenic is listed separately even though it is also analysed by the ICP-MS scan; if total arsenic is also to be analysed by a second method then that method should be specified. Total mercury is listed separately, and a method should be specified for its analysis if a specific method is desired. Recommendation: As previously recommended above, remove requirement for "ICP-MS scan" as this method of analysis is not appropriate for all parameters being measured.</p> <p>c. The superscripts on major ions, nutrients and ICP-MS scan are mixed up. The 1 should be on ICP-MS scan, 2 should be on ions, 3 on nutrients. This applies to superscripts 1, 2 and 3 throughout the SNP Annex. Recommendation: Make these corrections.</p> <p>d. ALS has replaced their existing ICP-MS instrument with collision-cell (CC-ICP-MS). Results are comparable, yet improved. Recommendation: Use wording such as "best available analytical methods that achieve appropriate detection limits".</p> <p>Page 2 of 16 Section 3 (sampling frequency)- De</p> | | | <p>done</p> <p>done</p> <p>2.Area 02-4.3 is fine, it is close to a small pond in between 02-4.1 and 02-4.2</p> <p>3.done</p> <p>4.Clarification was made in D2.a of SNP</p> <p>5.If AEMP stations are changed, then De Beers can apply to change the SNP to</p> | |
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DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| <p>Beers is unable to monitor seepage water through in line monitoring, however samples can be taken. Recommendation: Remove unilateral requirement for in-line monitoring.</p> <p>2. Page 3 of 16, Section A, Item 1, SNP 02-04 –Note that two stations near the airstrip are mentioned (02-04.1 and 02-04,2); however, De Beers' main monitoring location in that area is 02-04.3. Recommendation: clarification required.</p> <p>3. Page 8 of 16, Section A, Item 1, SNP 02-17 – As noted previously, should this refer to both SNP 02-17 (discharge from temporary treatment plant) and SNP 02-17b (discharge from permanent treatment plant)? Recommendation: clarification required.</p> <p>4. Page 9 of 16, Section A, Item 1, SNP 02-18 – It should be clarified that the whole-lake average for TDS is to be calculated using "calculated" TDS, not "measured". Recommendation: clarification required.</p> <p>5. Page 9 of 16, Section A, Item 1, SNP 02-18 – It is appreciated that the Board is providing clarification; however, this makes refinements and updates to the AEMP difficult in future. For example, spatial trends in Snap Lake are becoming less distinguishable, so there has been a recommendation in recent AEMP reports to reduce effort in the main basin and increase effort downstream. Making adjustments to the AEMP would be difficult if these stations are stated in the License. Recommendation: Use wording "calculate whole-lake average TDS, using all monitoring stations in the main basin of Snap Lake..." or revert to wording in previous license - "sufficient spatial and volumetric resolution".</p> <p>6. Page 10 of 16, Section A, Item 1, SNP 02-20 – Sampling frequency for the water quality profiles is listed as monthly, but should there be a qualifier that some months are not sampled because of concerns about safe working conditions on Snap Lake (is it November, December, and one other month)? A sediment sample is to be collected at this station once annually at the end of ice cover (spring) for metals and TOC analysis. This was in the original water license, and up until 2008 this was being done in April as one of the stations sampled for the annual</p> | | | <p>match. This should not be a problem, after the AEMP changes are approved.</p> <p>6. Not required. De Beers can note in their monthly reports if sampling could not be conducted due to unsafe conditions. Wording changed to annual sampling.</p> <p>8. done</p> <p>9. done</p> <p>10. There is no need to specify which method will be used, as we have not specified the analysis method for other parameters.</p> | |
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| <p>AEMP program. However, the AEMP sediment and benthic components were moved to September sampling as of 2009 and therefore this station is now being sampled for sediment quality in the fall. Recommendation: clarification required.</p> <p>7. Page 12 of 16, Item 1, SNP 02-24 – The condition requires sampling at SNAP28 four times per year during ice-cover. Meeting this condition may be difficult because of the open-water area evident near the diffuser, even during winter. Unsafe ice conditions have historically limited monitoring at this location. Recommendation: clarification required that this requirement is subject to safe conditions for sampling.</p> <p>8. Page 12 of 16, Item 1, SNP 02-24 – The Fisheries Authorization number is not provided. Text provides only "(give number here)". Recommendation: provide the number.</p> <p>9. Page 13 of 16, Section A, Items 6, 7 and 8 – These three items refer to a "quality assurance/quality control plan", an "approved QA/QC Plan", and the "SNP QA/QC Plan". If these are all the same document, then they should be identified with one consistent name. Recommendation: Recommend using one consistent name for these three items, specifically "quality assurance/quality control (QA/QC) plan".</p> <p>10. Page 13 of 16, Section A, Footnote 2 – TDS is included in the list of "major ions". It would be useful to clarify whether this TDS measurement is calculated from the ionic constituent concentrations. Recommendation: clarification required.</p> <p>11. Page 13 of 16, Section A, Footnotes 5 and 7 – The alga used for chronic toxicity testing has undergone a name change and is now called "<i>Pseudokirchneriella subcapitata</i>". The Environment Canada test method has been revised to reflect this change. Recommendation: correct test species name.</p> <p>12. Page 13 of 16, Section A, Footnote 6 – This footnote refers to excluding TDS data from the North Arm of Snap Lake when calculating the whole-lake average, because the North Arm is physically isolated from mixing with the rest of the lake. This should be the</p> | | | | |
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DFO Comments – Blue
 ENR Comment – Green
 AANDC Comments – Purple
 EC Comments – Orange
 SLEMA Comments – Grey
 AANDC Inspector's Comments – Black
 YKDFN Comments- Dark Red

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| <p>Northwest Arm. Recommendation: Change “North Arm” to “Northwest Arm”.</p> <p>13. Page 15 of 16, Section C, Item 7 – What SNP reference station is this referring to? Presumably this is a station that is already established, and if the water intake and effluent outfall structures have already been constructed, then does it still need to be monitored? Recommendation: clarification required.</p> <p>14. Page 15 of 16, Section D, Item 1 – For parameters regulated under Part F, Item 9 of the water license, the monthly SNP reports are to include graphs showing trends in parameter concentrations over the past two years. These reports are also to include graphs showing trends in whole-lake TDS concentrations but no time period was specified – presumably this should also be for the past two years. Recommendation: clarification required regarding time-period for trends in whole-lake TDS concentrations.</p> <p><u>Editorial Comments</u></p> <p>1. Page 13 of 16, Section A, Items 3 and 6 – Change “)” at end of the sentence to a period.</p> <p>2. Page 13 of 16, Section A, Item 8 – This item refers to SNP Section B, Item 7, but the reference should actually be to SNP Section A, Item 7.</p> <p>3. Page 13 of 16, Section A, Footnote 3 – The chemical formulae for nitrite and nitrate are using “zero” instead of “O” for oxygen.</p> <p>4. Page 14 of 16, Section B, Item 1 – Change “(Le.,” to “(i.e.,”.</p> <p>Page 15 of 16, Section C, Item 7 – Period missing from the end of the sentence.</p> <p>Recommendation: make these corrections.</p> | | | | |
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APPENDIX B

Implementation of Recommendations Related to Adaptive Management from MVEIRB’s 2003 Report of Environmental Assessment for the Snap Lake Diamond Project

| Recommendation or Suggestion | How the Recommendation/Suggestion is implemented in Water Licence MV2011L2-0004 |
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| <p>(S3) The Board suggest that an Adaptive Management Plan be prepared for approval as part of the Production Water Licence to ensure that contingency plans are in place in terms of geotechnical performance of the North Pile</p> | <ul style="list-style-type: none"> • A Response Framework will be developed as per Part E item 6 d. and schedule 4 item 2 the North Pile Management Plan (NP Plan). • As per condition in Schedule 4 item 2b) the proponent must provide details and rational for the monitoring of geotechnical stability for all components of the NP. In addition, Schedule 4 Item 2c) i. requires the proponent to provide a description of the Response Framework that will be implemented by the Licensee to link the results of monitoring to those corrective actions necessary to ensure that impacts to the receiving environment are prevented or minimized. • As per Part E item 10, a risk assessment of the NP is to be conducted in order to evaluate the adequacy of current operational procedures and monitoring efforts to ensure that impacts to the receiving environment are prevented or minimized. Any changes based on the outcome of the Risk Assessment will include details of the changes to the NP management Plan and a schedule for their implementation. |
| <p>(R8) De Beers develop a monitoring and Adaptive Management Plan to address uncertainty in lake mixing and density stratification. This shall include a monitoring program sufficient to provide early warning of persistent density stratification and a description of thresholds and mitigation measures such as tempering of the effluent stream or mechanical mixing. This recommendation could be implemented through the Production Water Licence AEMP recommended earlier in this report.</p> | <ul style="list-style-type: none"> • Station 02-18 of the Surveillance Network Program (SNP) is the point of compliance to determine the whole lake average (exclusive of the Northwest arm) concentration for TDS. Station 02-18 is comprised of 15 stations representing near, mid and far field sampling locations in the main body of Snap Lake. In order to address vertical as well as spatial density stratification within the lake, stations (where depth allowed) were sampled at 3 depths (surface, middle, and bottom). This allowed for 3D models of the lake to be developed which allowed for the tracking of any stratification. |

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| | <ul style="list-style-type: none"> •The Aquatic Effects Monitoring Plan (AEMP) monitors chemical parameters throughout the lake as well as several biological parameters to track overall lake health and behaviour. • Based on the data collected to date it is clear that there is no persistent density stratification occurring. However monitoring will continue to track any changes to the lake chemistry including vertical stratification using the AEMP and SNP Station 02-18. |
| <p>(R9) The Board further recommends that the Production Water Licence include requirements to implement an Adaptive Management Plan to mitigate density stratification in Snap Lake.</p> | <ul style="list-style-type: none"> • Based on the data collected to date it does not appear as though density stratification is an issue. However, if issues were to arise the AEMP Response Framework would be able to address any concerns (see below). • Part G, Item 3 and Schedule 6 Item 2e) require a description of an AEMP response framework that will link the results of the AEMP to those actions necessary to ensure that Project-related effects on the Receiving Environment remain within an acceptable range. The Response Framework sets up Action Levels, that, if exceeded, trigger an appropriate level of action. Action Levels are meant to be based on EA predictions and will include density stratification in Snap Lake. |
| <p>(S16) The AEMP should be linked to an Adaptive Management Plan and mitigation activities such as grouting, phosphorus abatement programs on site, enhanced sewage treatment, or artificial aeration</p> | <ul style="list-style-type: none"> • Part G Item 1d) requires the AEMP to identify the need for additional mitigation measures to reduce or eliminate Project related effects. • Part G Item 6 requires the proponent to describe the project related effects on the receiving environment as measured from the project inception as compared against EA predictions. • Part G, Item 3 and Schedule 6 Item 2e) require a description of an AEMP response framework that will link the results of the AEMP to those actions necessary to ensure that Project-related effects on the Receiving Environment remain within an acceptable range. The Response Framework sets up Action Levels, that, if exceeded, trigger an appropriate level of action. |

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| | <ul style="list-style-type: none">• Part G, Item 8 requires the submission of a Response Plan if any Action Levels are exceeded. The Response Plan will discuss actions related to observed monitoring results. These actions could include but are not limited to grouting, phosphorous abatement programs, enhanced sewage treatment or artificial aeration. |
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APPENDIX C

Reasons for Decision for Effluent Quality Criteria (EQC) for the Snap Lake Diamond Mine Renewal Water Licence

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1.0 Introduction

- As per the *Water and Effluent Quality Management Policy* (the Policy), the EQC for the Snap Lake Diamond Mine were evaluated to ensure consistency with the Policy objectives of protecting water uses and minimizing the deposit of waste. EcoMetrix Inc. was retained to provide EQC recommendations in line with the Policy. De Beers did not recommend changing any of the EQCs from Water Licence (WL) MV2001L2-0002.
- In the absence of site-specific water quality objectives (WQO), available guideline values (e.g., *CCME Guidelines for the Protection of Aquatic Life*) were deemed to provide an appropriate standard for water quality in Snap Lake and used as the basis for EQC derivation.
- The model developed by EcoMetrix to derive EQC for the Snap Lake Diamond Mine was deemed to be valid and some of the EQC recommended by EcoMetrix have been adopted directly for MV2011L2-0004. Some of EcoMetrix's recommended EQC have been modified based on additional evidence presented to the Board as noted below.
- It is understood that the EQC recommended by EcoMetrix were derived such that if the EQC are implemented by 2014 at the Snap Lake Diamond Mine, then the WQOs upon which the EQC were based will continue to be met in Snap Lake up until 2022.
- The mixing zone for the Snap Lake Diamond Mine is defined as a 200m radius around the effluent diffuser. EQC are set on the basis of meeting WQOs at the edge of the mixing zone. Although EcoMetrix derived EQC based on meeting WQOs at the outlet of Snap Lake, the lack of a strong spatial gradient of contaminant concentrations across the lake means that the EcoMetrix EQC will still ensure that WQOs are met at the edge of the mixing zone.
- At a minimum, EQC were considered for parameters that have been measured in the effluent at concentrations above the corresponding WQO for the receiving environment.
- EQC were also considered for parameters that were of concern on the basis of measurement of increasing trends in the receiving environment even if there was no evidence that a WQO would be exceeded.
- Maximum grab concentrations for EQC are generally double the monthly average concentration.
- For each potential EQC value, the Board has considered whether it is achievable at the Snap Lake Diamond Mine based on an analysis of effluent water quality data measured at SNP Station 02-17b from November 2008 to August 2011¹.
- Consistent with the Policy objective² of minimizing waste discharge, the Board has, in some cases, set EQC that are more stringent than what is required to meet water

¹ As provided to the Board in Excel format by De Beers on September 15, 2011 in response to a request at the September Technical Sessions

² Page 11 of the March 31, 2011 *Water and Effluent Quality Management Policy* states that "in accordance with the Boards' objective to minimize waste discharge, proponents are expected to minimize and, where feasible, to prevent waste from entering water in the NWT. Therefore, and consistent with the CCME nondegradation policy, the Boards may set EQC that

quality objectives in the receiving environment. In those cases, the Board considered the achievability of the EQC now and in future.

- Achievability also considered the requirements in Part F of MV2011L2-0004 for Response Plans to reduce loading of mine waste in the effluent to Snap Lake through implementation of enhanced source controls in the mine.
- EQC have been set based on the evidence presently before the Board. These EQC may be amended at a later date if new evidence is presented to the Board.
- There is a requirement in MV2011L2-0004 for Response Plans for total dissolved solids (TDS) (including fluoride and chloride), strontium and nitrogen (including ammonia, nitrate, and nitrite) that will contain source control and site-specific WQO information that may trigger a re-evaluation of EQC for these substances. The Response Plans are due on December 31, 2013.

Candidate EQC are considered below with a discussion of the evidence and how the above principles have been applied to individual parameters.

2.0 Identification of Contaminants of Potential Concern (COPC)

At the September 2011 technical sessions, parties identified COPCs that should be considered for EQC at the Snap Lake Diamond Mine. At the conclusion of the technical sessions, three categories of parameters were identified to be considered for development of EQCs:

- Parameters that had EQCs set in the existing licence;
- Parameters that have exceeded a WQO, are close to a WQO or which are trending upward (fluoride, chloride and manganese); and
- Parameters presently on an increasing trend in the effluent or Snap Lake (barium, boron, strontium). The increasing trend was considered more important than the absolute concentration or how close existing concentrations may be to a WQO. This approach acknowledged uncertainty in predictions and in mine operation by assuming that the trend could continue or that unpredicted source waters might be exposed (fluoride, for example, is high but is decreasing as the mine extends deeper but it remains as a COPC because it exceeds or has exceeded a WQO).

Based on this analysis, the Board retained an independent third-party consultant, EcoMetrix Inc., to recommend EQCs for the above parameters in a report which was submitted on

are more stringent than what is necessary to meet water quality standards in the receiving environment. When making this determination, the Boards will ensure that EQC are set at levels that the proponent can reasonably and consistently achieve.”

October 19, 2011. EcoMetrix recommended WQO and EQC for all of the parameters listed above and these recommendations are listed in Table 1. Aboriginal Affairs and Northern Development Canada (AANDC) recommended additional parameters for EQC consideration in its intervention to the public hearing and these parameters are also listed in Table 1.

3.0 Analysis of Effluent Data from November 2008-August 2011 – Screening for Which Parameters May Require EQC

Table 1 lists all of the parameters for which EQC were recommended as well as the median, 90th percentile and maximum concentrations of those parameters as measured in the effluent between November 2008 and August 2011. The table includes columns for all the WQOs that were recommended by either EcoMetrix or AANDC as no other party submitted WQO recommendations.

The following parameters, which are shaded red in Table 1, had 90th percentile or maximum concentrations in the effluent that exceeded any of the recommended WQOs: total suspended sediments (TSS), ammonia, nitrite, nitrate, aluminum, chromium, copper, phosphorus, fluoride, chloride, total dissolved solids (TDS), strontium and sulphate. Detailed EQC derivations are presented for these thirteen parameters below in Section 4.0. EQC for these parameters were derived on the basis of maintaining water quality in Snap Lake at levels below the recommended WQOs and based on the evidence before the Board.

The other parameters (i.e., arsenic, cadmium, lead, nickel, zinc, manganese, molybdenum, barium and boron) in Table 1 have not exceeded a WQO over the period of November 2008 to August 2011. EQC for these parameters were considered on a case-by-case basis as discussed in Section 5.0.

All of the parameters listed in Table 1 will continue to be monitored in the effluent through the SNP requirements and in the receiving environment through the AEMP.

4.0 EQC analysis of contaminants of potential concern that have exceeded WQO in the effluent

In this section, EQC are considered for the parameters that have had measured effluent concentrations above a recommended WQO (shaded red in Table 1). Parameters are discussed in the order they appear in Table 1.

Note that in the following discussion:

- the CCME Canadian Environmental Quality Guidelines for the Protection of Aquatic Life will be referred to as the “CCME Guidelines”
- concentrations of ammonia, nitrite and nitrate are reported in mg/L as nitrogen

- concentrations of metals refer to total metal concentrations only

4.1 Total Suspended Sediments (TSS)

Water quality objective: EcoMetrix recommended using the CCME Guideline value of 5 mg/L as the WQO for TSS. No other recommendations were made and this WQO was used as the basis for EQC derivation.

EQC Derivation Based on Accepted WQO: EcoMetrix recommended a monthly average concentration of 7 mg/L which would mean a maximum grab concentration of 14 mg/L. These values are unchanged from WL MV2001L2-0002.

Achievability of EQC: The Board notes that there have been exceedances of the maximum grab concentration between November 2009 to August 2011, however, the majority of measured TSS concentrations in the effluent are less than the detection limit of 3 mg/L. Also, De Beers did not request a change to the maximum grab limit. Therefore, these EQC are considered achievable.

Considerations of the Receiving Environment: The concentration of TSS in Snap Lake is consistently below the detection limit of 3 mg/L.

Conclusion: EQC for TSS will remain at 7 mg/L maximum average and 14 mg/L maximum grab concentration in MV2011L2-0004.

4.2 Ammonia

Water quality objective: EcoMetrix recommended a WQO for ammonia of 1.47 mg/L to maintain un-ionized ammonia concentrations in Snap Lake below the CCME Guideline value for chronic exposure of 0.019 mg/L at a pH and temperature combination of 7.5 and 17.9°C. The temperature and pH values were taken from Snap Lake monitoring data and represent the worst-case conditions for the formation of un-ionized ammonia. De Beers questioned Dr. Hart of EcoMetrix on these choices of temperature and pH pointing out that under lower temperature (winter) conditions, the WQO for ammonia would be much higher³. However, and as confirmed by Dr. Hart, it is appropriate to use conservative assumptions that will protect the lake under all conditions⁴.

In addition to a WQO for total ammonia, AANDC also recommended a WQO of 0.019 mg/L for un-ionized ammonia as per the CCME Guidelines. However, the WQO for total ammonia, as described above, has been calculated using conservative assumptions for pH and temperature that will ensure that the level of un-ionized ammonia will remain below 0.019 mg/L. Therefore, a WQO of 1.47 mg/L total ammonia was used as the basis for EQC derivation.

³ Page 53 line 11 to page 57 line 18, Transcript of De Beers Snap Lake Public Hearing, December 14, 2011

⁴ Page 80 line 17 to page 81 line 5, Transcript of De Beers Snap Lake Public Hearing, December 14, 2011

EQC Derivation Based on Accepted WQO: EcoMetrix recommended a monthly average concentration of 1.75 mg/L ammonia, however, this value did not consider losses of ammonia that occur naturally in the lake. AEMP data showed that ammonia concentrations in Snap Lake were lower than predicted by EcoMetrix. Assimilation processes such as nitrification and dilution in Snap Lake have reduced ammonia concentrations, although the actual rate of loss cannot be quantified. Dr. Hart stated⁵ that the EcoMetrix model overestimates concentrations of ammonia in the lake by at least two times most likely because the natural loss rate was not factored in.

Figure A6-19 of the 2010 Snap Lake AEMP Annual Report confirms that ammonia is being assimilated in Snap Lake. Ammonia concentrations increased from January 2006 to January 2009 but, for 2009 and 2010, Figure A6-19 shows a cycle of high ammonia in the under ice samples, lower values in the open water and no difference in concentrations between 2009 and 2010 at the mixing zone edge, the mid-field and the far-field sites. Thus, ammonia levels may have reached a plateau, although this should be confirmed in subsequent AEMP reports. Since the EcoMetrix model did not account for this, the EcoMetrix recommended EQC for ammonia is overly conservative.

EQC for ammonia were therefore derived from the measured differences in concentration between the end-of-pipe effluent and the edge of the mixing zone in 2010 using data from SNP stations 02-17b and 02-20 respectively. A conservative assimilation estimate was calculated as the ratio between the average ammonia concentration in the effluent and the maximum ammonia concentration measured at the edge of the mixing zone. As shown in Table 2, concentrations of ammonia are reduced approximately 8 times between the end-of-pipe and the edge of the mixing zone. Therefore, in order to consistently meet a WQO of 1.47 at the edge of the mixing zone, the EQC should be $1.47 \times 8 = 12$ mg/L as a monthly average concentration.

The Board notes that Environment Canada, in its intervention to the public hearing, also recommended a maximum grab EQC of 10 mg/L for ammonia but this value was based on achievability rather than meeting a specific WQO.

Achievability: Although a concentration of 12 mg/L was calculated as a water quality-based EQC, the effluent data presented in Table 1 suggest that a lower EQC is achievable at this time. Lowering the EQC to 10 mg/L for a maximum average concentration is still achievable based on current operating conditions and is consistent with the Policy's waste minimization objective. De Beers has predicted⁶ that ammonia concentrations in the effluent may increase

⁵ Page 15 lines 6 to 10, Transcript of De Beers Snap Lake Public Hearing, December 14, 2011

⁶ Table 9.4, Snap Lake Mine Site Water Quality Report, Golder Associates, dated June 2011 and submitted with De Beers' renewal application on June 8, 2011 as Supporting Document 6

up to 2022 but the upper bound prediction does not exceed 10 mg/L. Therefore, 10 mg/L as a maximum average concentration of ammonia is achievable now and in future.

Considerations of the Receiving Environment: Figure A6-19 of the 2010 Snap Lake AEMP Annual Report shows that concentrations of total ammonia have increased over the years of 2006 and 2009, but may be at a plateau. Concentrations measured at the edge of the mixing zone were as high as 0.24 mg/L and about 0.15 mg/L in the far-field. Thus ammonia levels are currently at up to almost 10 percent of the WQO even in the far-field area of Snap Lake. As well, De Beers' 2011 water quality modelling⁷ predicts that, based on current operations, ammonia concentrations in the near-field of Snap Lake will reach 2.1 mg/L which does exceed the WQO. Therefore, an EQC for ammonia is warranted and should be based on keeping levels in Snap Lake below the WQO as described above.

Conclusion: EQC for ammonia will be set at 10 mg/L maximum average and 20 mg/L maximum grab concentration in MV2011L2-0004. The Board notes that the Nitrogen Response Plan, due December 31, 2013, may identify additional source control measures that will reduce ammonia loadings to Snap Lake. There was no evidence provided to change the loading limit for ammonia and, therefore, the loading limit remains unchanged from MV2001L2-0002.

4.3 Nitrite

Water quality objective: EcoMetrix recommended using the CCME Guideline value of 0.06 mg/L as the WQO for nitrite. No other recommendations were made and this WQO was used as the basis for EQC derivation.

EQC Derivation Based on Accepted WQO: EcoMetrix recommended a monthly average concentration of 0.06 mg/L but acknowledged that this value is likely too low because, similar to ammonia, the loss rates for nitrite were not accounted for in their model.

Figure A6-18 of the 2010 Snap Lake AEMP Annual Report confirms that nitrite is being lost or assimilated in Snap Lake. As was the case with ammonia, nitrite concentrations increased from January 2006 to January 2009 but, for 2009 and 2010, Figure A6-18 shows a cycle of high nitrite in the under ice samples, lower nitrite in the open water and no difference in concentrations between 2009 and 2010 at the mixing zone edge, the mid-field and the far-field sites. Thus, nitrite levels may also have reached a plateau, although this should be confirmed in subsequent AEMP reports. Since the EcoMetrix model did not account for this, the EcoMetrix recommended EQC for nitrite is overly conservative.

⁷ Page 26, Water Quality Modelling Report, Golder Associates, dated June 2011 and submitted with De Beers' renewal application on June 8, 2011 as Supporting Document 7

EQC for nitrite were therefore derived from the measured concentration difference between the end-of-pipe effluent and the edge of the mixing zone in 2010 using data from SNP stations 02-17b and 02-20 respectively. A conservative assimilation estimate was calculated as the ratio between the average nitrite concentration in the effluent and the maximum nitrite concentration measured at the edge of the mixing zone. As shown in Table 2, concentrations of nitrite are reduced approximately 10 times between the end-of-pipe and the edge of the mixing zone. Therefore, in order to consistently meet a WQO of 0.06 mg/L at the edge of the mixing zone, the EQC should be $0.06 \times 10 = 0.6$ mg/L as a monthly average concentration.

Achievability: The median, 90th percentile and maximum concentrations of nitrite in the effluent between November 2009 and August 2011 were only 0.16 mg/L, 0.29 mg/L and 0.67 mg/L respectively. Although a concentration of 0.6 mg/L was calculated as a water quality-based EQC, the effluent data suggest that a lower EQC is achievable at this time. Lowering the EQC to 0.5 mg/L for a maximum average concentration is still achievable based on current operating conditions and is consistent with the Policy's waste minimization objective.

Considerations of the Receiving Environment: As discussed above, Figure A6-18 of the 2010 AEMP shows that nitrite concentrations increased between 2006 to 2009 but may be reaching a plateau. Concentrations of nitrite are approximately 0.018 mg/L at the edge of the mixing zone and up to 0.01 mg/L in the far-field in 2010. Thus nitrite levels are already almost 20 percent of the WQO even in the far-field area of Snap Lake. Therefore, an EQC for nitrite is warranted and should be based on keeping levels in Snap Lake below the WQO as described above.

Conclusion: The EQC for nitrite will be set at 0.5 mg/L maximum average and 1.0 mg/L maximum grab concentration in MV2011L2-0004. The Board notes that the Nitrogen Response Plan, due December 31, 2013, may identify additional source control measures that will reduce nitrite loadings to Snap Lake.

4.4 Nitrate

Water quality objective: EcoMetrix recommended using the 2011 draft Environment Canada guideline value of 3.61 mg/L as the WQO for nitrate. The rationale was that the 2011 value was derived using the current CCME protocol for guideline derivation whereas the 2003 CCME Guideline value of 2.94 mg/L was derived using older protocols. AANDC agreed with this recommendation.

In August 2011, De Beers submitted an evaluation⁸ of the ecological relevance of the guideline values for nitrate with respect to Snap Lake. This evaluation concluded that a WQO of 6.25 mg/L would be sufficiently protective and possibly overly conservative. However, at the public

⁸ Technical Memorandum from Golder Associates to De Beers re Nitrate toxicity, dated August 31, 2011

hearing De Beers' consultant, Dr. Chapman, stated⁹ that although they have reviewed the literature on nitrate they have not yet developed a site-specific WQO for Snap Lake. In Appendix A of its response to interventions, De Beers states that it has commenced the work necessary to develop a site-specific WQO for nitrate and this commitment has been codified in the requirements of the Nitrogen Response Plan due December 31, 2013.

Dr. Hart from EcoMetrix agreed that, based on the work done by De Beers to date, further study on a site-specific WQO for nitrate is warranted¹⁰. However, EcoMetrix did not endorse the use of 6.25 mg/L as a WQO for Snap Lake at this time. Given this fact and the fact that De Beers does not consider that their work on a site-specific nitrate WQO is completed, the Board must use the evidence before it at this time which is that 3.61 mg/L is an appropriate WQO for Snap Lake. This WQO, and the resultant EQC, may be revised at a later date when more information becomes available.

EQC Derivation Based on Accepted WQO: EcoMetrix recommended a monthly average concentration of 3.83 mg/L in order to maintain a water quality objective of 3.61 mg/L in Snap Lake until the end of mine life. Unlike the results for ammonia and nitrite, AEMP results show that, although there is some assimilation of effluent nitrate such that concentrations are reduced in the mixing zone, nitrate concentrations are steadily increasing in all areas of the lake.

Achievability: An EQC of 3.83 mg/L of nitrate is not achievable at this time as the median effluent nitrate concentration between November 2009 and August 2011 was 5.7 mg/L. However, and as discussed in the main body of the Reasons for Decision, De Beers has committed to a re-evaluation of its explosives management practices and enhanced source control may reduce nitrogen loadings which could allow this EQC to be achieved. Any potential source control options will be discussed in the Nitrogen Response Plan (Part F, Item 17 and Schedule 5 of MV2011L2-0004) that is due on December 31, 2013.

Considerations of the Receiving Environment: Figure A6-16 of the 2010 Snap Lake AEMP Annual Report shows that concentrations of nitrate are increasing in all areas of Snap Lake. Concentrations measured in at the edge of the mixing zone were as high as 1.43 mg/L and about 0.98 mg/L in the far-field. Thus nitrate levels are currently at up to almost 30% of the WQO even in the far-field area of Snap Lake and there is no evidence of anything other than continued accumulation. As well, De Beers' 2011 water quality modelling¹¹ predicts that, based on current operations, nitrate concentrations in the near-field of Snap Lake will reach 4.4 mg/L which does exceed the WQO. Therefore, an EQC for nitrate is warranted and should be based on keeping levels in Snap Lake below the WQO as described above.

⁹ Page 91, lines 1-5 of the Transcript for the De Beers Snap Lake Public Hearing, December 13, 2011

¹⁰ Page 46, lines 11-25 of the Transcript for the De Beers Snap Lake Public Hearing, December 14, 2011

¹¹ Page 26, Water Quality Modeling Report, Golder Associates, dated June 2011 and submitted with De Beers' renewal application on June 8, 2011 as Supporting Document 7

Conclusion: Although the EQC derived for nitrate on the basis of maintaining a WQO of 3.61 mg/L in Snap Lake over the life of mine is not currently achievable, De Beers' efforts at enhanced source control¹² may mean that the EQC will be achievable by 2015. Therefore, the EQC for nitrate as of January 1, 2015 should be 4 mg/L and 8 mg/L for monthly average and monthly grab concentrations respectively. Once De Beers has completed its work on a site-specific WQO for nitrate in December 2013, the Board may consider amending the 2015 EQC based on the new evidence. Between now and 2015, an interim EQC for nitrate will be set that is achievable and that should maintain nitrate levels in Snap Lake below the WQO for the time being.

An interim EQC has been calculated for nitrate based on the current dilution capacity of Snap Lake as determined from 2010 SNP data from stations 02-17b and 02-20 at the end-of-pipe and the edge of the mixing zone respectively. A conservative dilution rate was calculated as the ratio between the average nitrate concentration in the effluent and the maximum nitrate concentration measured at the edge of the mixing zone. As shown in Table 3, concentrations of nitrate are diluted approximately 6 times between the end-of-pipe and the edge of the mixing zone. Therefore, in order to consistently meet a WQO of 3.61 mg/L at the edge of the mixing zone, the interim EQC should be $3.61 \times 6 = 22$ mg/L as a monthly average concentration and 44 mg/L as a monthly grab concentration.

Whereas the EQC derived by the EcoMetrix model considered the accumulation of nitrate in Snap Lake over time, the interim EQC considers this as well as the current level of dilution in the mixing zone. The available dilution of the mixing zone is expected to decrease as concentrations of nitrate continue to rise. Therefore, this interim EQC will only ensure that the WQO is met at the edge of the mixing zone for the next few years before needing to be re-evaluated. AEMP and SNP monitoring will test these assumptions going forward.

There was no evidence provided to change the loading limit for nitrate and, therefore, the loading limit remains unchanged from MV2001L2-0002.

4.5 Aluminum

Water quality objective: EcoMetrix recommended using the CCME Guideline value of 0.1 mg/L as the WQO for aluminum for Snap Lake. AANDC recommended a WQO of 0.05 mg/L based on a guideline value from the British Columbia Ministry of the Environment (BCMOE). The Board has chosen to base the EQC derivation on the CCME Guideline value as the CCME values are meant to apply on a national basis instead of a provincial basis and to provide consistency of approach for all parameters within this licence.

¹²At the public hearing on December 13, 2011, De Beers confirmed that "The best available technology for removal of nitrate is source control, or in other words, explosives management. We are currently taking aggressive steps to improve explosives blasting and materials management practices which will be reflected in a formal plan" (page36 of transcript). These efforts will be reported in the Nitrogen Response Plan as per Part F, Item 17 of MV2011L2-0004.

EQC Derivation Based on Accepted WQO: EcoMetrix recommended a monthly average concentration of 0.1 mg/L which would mean a maximum grab concentration of 0.2 mg/L.

Achievability: EcoMetrix deemed these values to be achievable based on the calculated average effluent concentration of aluminum of 0.0548 mg/L for the period of November 2008 to October 2010. As shown in Table 1, between November 2008 to August 2011, the median value of aluminum in the effluent was determined to be 0.024 mg/L, the 90th percentile value was 0.109 mg/L and the maximum measured value was 0.194 mg/L. De Beers has predicted¹³ that aluminum concentrations in the effluent may increase up to 2022 but the upper bound prediction does not exceed 0.04 mg/L. Therefore, 0.1 mg/L as a maximum average concentration of ammonia is deemed to be achievable now and in the future.

Considerations of the Receiving Environment: Page 14 of De Beers' 2011 water quality modelling¹⁴ report states that their analysis indicates that "a considerable amount of aluminum was settling in Snap Lake, leading to lower water concentrations than would be predicted using a conservative mass balance." This observation is consistent with the results from the 2010 Snap Lake AEMP Annual Report which show no increasing trend of aluminum concentrations over time in Snap Lake. As well, De Beers' 2011 water quality modelling predicts that, based on current operations, aluminum concentrations in Snap Lake will not exceed the WQO at any time during the mine life. This evidence indicates that despite the fact that aluminum concentrations have exceeded the WQO in the effluent, there is not a great concern at this time for the effects of aluminum in the receiving environment nor is a concern predicted for the future.

Conclusion: The EQC for aluminum will be set at 0.1 mg/L maximum average and 0.2 mg/L maximum grab concentration in MV2011L2-0004.

4.6 Chromium

Water quality objective: The CCME Guideline values for chromium III and chromium VI are 0.0089 and 0.001 mg/L respectively. As part of the Environmental Assessment (EA) of the Snap Lake Diamond Mine, De Beers developed¹⁵ site-specific WQO for chromium III and VI of 0.047 and 0.0021 mg/L, respectively, and these values were accepted at the time. EcoMetrix stated that they did not review the derivation of those site-specific WQO but there is no evidence to suggest that they are not still valid. Therefore, the WQOs of 0.047 and 0.0021 mg/L for chromium III and chromium VI, respectively, have been used below in the evaluation of an EQC for chromium.

¹³ Table 9.4, Snap Lake Mine Site Water Quality Report, Golder Associates, dated June 2011 and submitted with De Beers' renewal application on June 8, 2011 as Supporting Document 6

¹⁴ Page 26, Water Quality Modelling Report, Golder Associates, dated June 2011 and submitted with De Beers' renewal application on June 8, 2011 as Supporting Document 7

¹⁵ Developers Assessment Report for the Snap Lake Diamond Mine, De Beers Canada Mining Inc, February 2002

EQC Derivation Based on Accepted WQO: EcoMetrix derived an EQC based on meeting the WQO for chromium III because this is the form of chromium expected to be the predominant form of this metal at the Snap Lake Diamond Mine. This is confirmed by the AEMP which shows that chromium VI concentrations have always been below the method detection limit¹⁶ of 0.001 mg/L; therefore, the predominant form of chromium in Snap Lake is chromium III. EcoMetrix recommended a monthly average concentration of 0.013 mg/L in order to maintain a water quality objective for chromium III of 0.0089 mg/L in Snap Lake. Applying the same EQC/WQO ratio to a WQO of 0.047 mg/L gives an EQC of 0.15 mg/L and a maximum grab concentration of 0.3 mg/L.

Achievability: Although a maximum average concentration of 0.15 mg/L was calculated as a water quality-based EQC, the effluent data presented in Table 1 suggest that a lower EQC is achievable at this time. As shown in Table 1, the median, 90th percentile, and maximum total chromium concentrations measured in the effluent are 0.00067, 0.0029 and 0.01 mg/L respectively. Lowering the EQC to 0.01 mg/L for a maximum average concentration is still achievable based on current operating conditions and is consistent with the Policy's waste minimization objective. De Beers has predicted¹⁷ that chromium concentrations in the effluent will not increase in future. Therefore, 0.01 mg/L as a maximum average concentration of chromium is achievable now and in future.

Considerations of the Receiving Environment: The De Beers' 2011 water quality modelling¹⁸ report predicts that chromium levels will not exceed 0.0029 mg/L and, therefore, is predicted to remain below both the CCME Guideline value and the site-specific WQO for chromium III. This observation is consistent with the results from the 2010 Snap Lake AEMP Annual Report which show no increasing trend in chromium concentrations over time in Snap Lake.

Conclusion: The maximum average and maximum grab EQC for total chromium will be set at 0.01 and 0.02 mg/L respectively in MV2011L2-0004.

4.7 Copper

Water quality objective: EcoMetrix recommended using the CCME Guideline value of 0.0024 mg/L as the WQO for copper for Snap Lake based on a hardness concentration of 100 mg/L. AANDC agreed with this recommendation and a WQO of 0.0024 mg/L has been used in the derivation of an EQC for copper.

¹⁶ Appendix A to De Beers Response to Interventions, November 21, 2011

¹⁷ Table 9.4, Snap Lake Mine Site Water Quality Report, Golder Associates, dated June 2011 and submitted with De Beers' renewal application on June 8, 2011 as Supporting Document 6

¹⁸ Page 26, Water Quality Modelling Report, Golder Associates, dated June 2011 and submitted with De Beers' renewal application on June 8, 2011 as Supporting Document 7

EQC Derivation Based on Accepted WQO: EcoMetrix recommended a monthly average concentration of 0.0033 mg/L which would mean a maximum grab concentration of 0.0066 mg/L.

Achievability: The 90th percentile and maximum values for copper in the effluent are 0.0015 and 0.004 mg/L respectively and so these EQC values are deemed to be achievable at the Snap Lake Diamond Mine. As well, De Beers has predicted¹⁹ that copper concentrations in the effluent will not increase over time so these EQC will be achievable in future.

Considerations of the Receiving Environment: The 2010 Snap Lake AEMP Annual Report shows no increasing trend in copper concentrations over time in Snap Lake. However, the De Beers' 2011 water quality modelling²⁰ report predicts that copper levels may reach the WQO of 0.0024 mg/L sometime during mine life. Therefore, an EQC is warranted for copper.

Conclusion: EQC for copper will be 0.003 mg/L maximum average and 0.006 mg/L maximum grab concentration in MV2011L2-0004.

4.8 Fluoride

Water quality objective: The CCME Guideline for fluoride is 0.12 mg/L but EcoMetrix proposed 0.4 mg/L which is the guideline value from the British Columbia Ministry of the Environment (BCMOE). The EcoMetrix report states that BC considers that fluoride concentrations > 7.8 mg/L are suspect because of solubility concerns and so the 11.5 mg/L data point for caddis fly exposure that was divided by 100 to derive the CCME value was considered suspect. They state that the BC Guideline of 0.4 mg/L was derived by dividing an acute toxicity/hardness relationship by 100 – this suggests that the source value would have been 40 mg/L and thus even more suspect than the CCME value of 11.2. They also cite a range of chronic values of 2.3-7.3 to 75-91 mg/L to support a conclusion that 0.4 is protective. The same logic would also support the CCME value and the Board has used the CCME value to derive a fluoride EQC as it is intended apply nationally and to provide consistency of approach for all parameters within this licence.

In Appendix A to its response to interventions, De Beers states that it believes that even the BCMOE WQO for fluoride of 0.4 mg/L is overly conservative because it does not take into account toxicity modifying factors such as increasing hardness in Snap Lake. However, De Beers did not submit any specific evidence on this point. Therefore, and until new evidence is submitted to the contrary, the Board accepts that the CCME Guideline value of 0.12 mg/L is appropriate for Snap Lake.

¹⁹ Table 9.4, Snap Lake Mine Site Water Quality Report, Golder Associates, dated June 2011 and submitted with De Beers' renewal application on June 8, 2011 as Supporting Document 6

²⁰ Page 26, Water Quality Modelling Report, Golder Associates, dated June 2011 and submitted with De Beers' renewal application on June 8, 2011 as Supporting Document 7

EQC Derivation Based on Accepted WQO: EcoMetrix recommended a monthly average concentration of 0.5 mg/L in order to maintain a water quality objective of 0.4 mg/L in Snap Lake until the end of mine life. Applying the same EQC/WQO ratio to a WQO of 0.12 mg/L gives an EQC of 0.15 mg/L and a maximum grab concentration of 0.3 mg/L.

Achievability: These EQC values are not achievable as median values of fluoride in the effluent are already at 0.39 mg/L and the evidence provided by De Beers was that it was not cost effective²¹ to treat effluent to remove TDS. De Beers also stated that fluoride concentrations in the effluent were expected to decrease²² in the future because the deeper they mine, the lower the fluoride concentrations become in the groundwater.

Fluoride is a constituent of TDS. The TDS Response Plan, as required under Part F, Item 16 and Schedule 5 of MV2011L2-0004, will document De Beers efforts at source control of TDS levels (including fluoride) and at deriving a site-specific WQO for TDS, fluoride and chloride. The Response Plan is due December 31, 2013 and there is a possibility that source control of minewater may allow the fluoride EQC derived above to be achieved by 2015. Also, the site-specific WQO developed for fluoride may be higher than 0.12 mg/L and the EQC may be amended on that basis.

Considerations of the Receiving Environment: De Beers' 2011 water quality modelling²³ predicts that, based on current operations, fluoride concentrations in the near-field and far-field of Snap Lake will reach as high as 0.17 and 0.15 mg/L, respectively, both of which exceed the WQO of 0.12 mg/L. However, the concentration of fluoride in the effluent is predicted to decrease from now until the end of mine life. Figure A6-8 of the 2010 Snap Lake AEMP Annual Report shows that fluoride concentrations in Snap Lake are no longer increasing although concentrations measured in at the edge of the mixing zone in 2010 were as high as 0.14 mg/L and were about 0.12 mg/L in the far-field. Thus fluoride levels are currently exceeding the WQO in the receiving environment. This exceedance was acknowledged in the 2010 AEMP Annual Report however, because of the possible ameliorating effect of increasing water hardness the report concluded that "the observed fluoride concentrations are not expected to cause effects to aquatic biota in Snap Lake."²⁴ Nonetheless, until a higher WQO for fluoride can be derived based on the effect of hardness for example, an EQC for fluoride is warranted for MV2011L2-0004 based on the CCME Guideline value as a WQO.

²¹ On December 13, 2011 of the public hearing, De Beers stated that "For example, reverse osmosis, the most well-known technology for removing TDS from the effluent stream, has not advanced to the point where it is economically feasible or practical in our application, and it has its own environmental impacts. The mine could not continue operating if we were required to implement this technology." (page 26 of the transcript)

²² Page 25, Water Quality Modelling Report, Golder Associates, dated June 2011 and submitted with De Beers' renewal application on June 8, 2011 as Supporting Document 7

²³ Ibid, page 26

²⁴ Page 2-43 of the 2010 Snap Lake AEMP Annual Report

Conclusion: Although the EQC derived for fluoride on the basis of maintaining a WQO of 0.12 mg/L in Snap Lake over the life of mine is not currently achievable, De Beers' efforts at enhanced source control²⁵ may mean that the EQC will be achievable by 2015. Therefore, the EQC for fluoride as of January 1, 2015 should be 0.15 mg/L and 0.3 mg/L for monthly average and monthly grab concentrations respectively. Once De Beers has completed its work on source control and on a site-specific WQO for TDS and fluoride in December 2013, the Board may consider amending the 2015 EQC based on the new evidence.

An interim EQC cannot be set for fluoride based on maintaining the WQO in Snap Lake because the WQO has already been exceeded in the near-field area of Snap Lake.

4.9 Chloride

Water quality objective: EcoMetrix recommended a WQO for chloride of 213 mg/L based on a range of toxicity data. However, on November 30, 2011 and after submission of the EcoMetrix report, the CCME published a water quality guideline value for chloride of 120 mg/L for long term exposure that was submitted to the Board as evidence. As an undertaking to the public hearing, De Beers submitted a memorandum entitled the "Relationship between chloride toxicity and hardness". The memo cited a number of studies that have documented how increasing hardness can reduce the toxicity of chloride. However, De Beers did not submit any specific evidence for a site-specific chloride WQO and no party submitted evidence to modify the CCME value. Therefore, the Board has used the WQO of 120 mg/L chloride as the basis for the EQC derivation.

EQC Derivation Based on Accepted WQO: EcoMetrix recommended a monthly average concentration of 278 mg/L in order to maintain a water quality objective of 213 mg/L in Snap Lake until the end of mine life. Applying the same EQC/WQO ratio to a WQO of 120 mg/L gives an EQC of 160 mg/L and a maximum grab concentration of 320 mg/L.

Achievability: These EQC values are not achievable as median values of chloride in the effluent are already at 247 mg/L.

Chloride is a constituent of Total Dissolved Solids (TDS). The TDS Response Plan, as required under Part F, Item 16 and Schedule 5 of MV2011L2-0004, will document De Beers efforts at source control of TDS levels (including chloride) and at deriving a site-specific WQO for TDS, fluoride and chloride. The Response Plan is due December 31, 2013 and there is a possibility that source control of chloride-containing minewater may allow the chloride EQC

²⁵ On December 13, 2011 of the public hearing, De Beers confirmed that they "have also increased our focus on underground water control. If you can limit the underground water, you limit the problem on the surface. As part of that program, we have initiated trials of new grouting methods. IF successful, grouting efficiency will improve in certain applications and reduce water flows to the mine substantially." (pages 21-22 of hearing transcript). These efforts will be described in the TDS Response Plan as per Part F, Item 16 of MV2011L2-0004.

derived above to be achieved by 2015. Also, the site-specific WQO developed for chloride may be higher than 120 mg/L and the EQC may be amended on that basis.

Considerations of the Receiving Environment: De Beers' 2011 water quality modelling²⁶ predicts that, based on current operations, chloride concentrations in the near-field Snap Lake will reach levels between 237 to 347 mg/L, which exceeds the WQO of 120 mg/L. These predicted chloride levels also exceed other chloride WQOs as suggested by EcoMetrix of 213 mg/L and the United States Environmental Protection Agency (USEPA) of 230 mg/L. Figure A6-7 of the 2010 Snap Lake AEMP Annual Report shows that chloride concentrations are increasing over time in Snap Lake. Concentrations measured in at the edge of the mixing zone in 2010 were as high as 81 mg/L and were about 70 mg/L in the far-field. Thus chloride levels are currently at up to 70 percent of the WQO for the receiving environment. Therefore, an EQC for chloride is warranted for MV2011L2-0004.

Conclusion: Although the EQC derived for fluoride on the basis of maintaining a WQO of 120 mg/L in Snap Lake over the life of mine is not currently achievable, De Beers' efforts at enhanced source control²⁷ may mean that the EQC will be achievable by 2015. Therefore, the EQC for chloride as of January 1, 2015 should be 160 mg/L and 320 mg/L for monthly average and monthly grab concentrations respectively. Once De Beers has completed its work on a site-specific WQO for TDS and chloride in December 2013, the Board may consider amending the EQC based on the new evidence. Between now and 2015, an interim EQC for chloride will be set that is achievable and that should maintain the chloride WQO at the edge of the mixing zone for the time being.

An interim EQC has been calculated for chloride based on the current dilution capacity of Snap Lake as determined from 2010 SNP data from stations 02-17b and 02-20 at the end-of-pipe and the edge of the mixing zone respectively. A conservative dilution rate was calculated as the ratio between the average chloride concentration in the effluent and the maximum chloride concentration measured at the edge of the mixing zone. As shown in Table 3, concentrations of chloride are diluted approximately 2.6 times between the end-of-pipe and the edge of the mixing zone. Therefore, in order to consistently meet a WQO of 120 mg/L at the edge of the mixing zone, the interim EQC should be $120 \times 2.6 = 310$ mg/L as a monthly average concentration and 620 mg/L as a monthly grab concentration. Median, 90th percentile and maximum concentrations of chloride in the effluent have been 247, 285 and 325 mg/L and, therefore the interim EQC is achievable.

²⁶ Page 26, Water Quality Modelling Report, Golder Associates, dated June 2011 and submitted with De Beers' renewal application on June 8, 2011 as Supporting Document 7

²⁷ On December 13, 2011 of the public hearing, De Beers confirmed that they "have also increased our focus on underground water control. If you can limit the underground water, you limit the problem on the surface. As part of that program, we have initiated trials of new grouting methods. IF successful, grouting efficiency will improve in certain applications and reduce water flows to the mine substantially." (pages 21-22 of hearing transcript). These efforts will be described in the TDS Response Plan as per Part F, Item 16 of MV2011L2-0004.

Note that whereas the EQC derived by the EcoMetrix model considered the accumulation of chloride in Snap Lake over time, the interim EQC has only been based on the current level of dilution in the mixing zone. The available dilution of the mixing zone is expected to decrease as background concentrations of chloride continue to rise. Therefore, this interim EQC will only ensure that the chloride WQO is met at the edge of the mixing zone for the next few years before needing to be re-evaluated. AEMP and SNP monitoring will confirm these assumptions

4.10 Total Dissolved Solids (TDS)

Water quality objective: During the Environmental Assessment for the Snap Lake Diamond Mine, a water quality objective for TDS of 350 mg/L as a whole lake average for Snap Lake was set. This value was set based on what parties knew of TDS toxicity as well as De Beers' predictions of the maximum amount of TDS that would accumulate in Snap Lake as a result of the mine. The WQO for TDS was incorporated into a recommended measure by MVEIRB and the Snap Lake WL has a condition requiring the maintenance of a 350 mg/L whole lake average TDS objective for Snap Lake.

De Beers has begun to investigate a toxicity-based TDS water quality objective that is site-specific for Snap Lake. According to De Beers, this work will be completed by December 31, 2013.

EQC Derivation Based on Accepted WQO: EcoMetrix recommended a monthly average concentration of 428 mg/L in order to maintain a water quality objective of 350 mg/L in Snap Lake until the end of mine life.

Achievability: This EQC is not achievable as median values of TDS in the effluent are already at 552 mg/L

Considerations of the Receiving Environment: De Beers' 2011 water quality modelling²⁸ predicts that, based on current operations, TDS concentrations in the near-field Snap Lake will reach levels between 394 to 632 mg/L, which exceeds the WQO of 350 mg/L. Figure A6-2 of the 2010 Snap Lake AEMP Annual Report shows that TDS concentrations are increasing over time in Snap Lake. Concentrations measured in at the edge of the mixing zone in 2010 were as high as 225 mg/L and were about 175 mg/L in the far-field. Thus TDS levels are currently at up to 65 percent of the WQO for the receiving environment. Ordinarily, an EQC for TDS would be warranted based on this evidence; however, since there is already a WQO for TDS in the water licence, an EQC may not be of added benefit.

Conclusion: Water licence MV2011L2-0004 already contains a WQO of 350 mg/L TDS based on a recommended measure of the Snap Lake Environmental Assessment. Any derived EQC is only meant to maintain the same WQO and adds no value to the regulation of TDS at the

²⁸ Page 26, Water Quality Modelling Report, Golder Associates, dated June 2011 and submitted with De Beers' renewal application on June 8, 2011 as Supporting Document 7

Snap Lake Diamond Mine. The TDS Response Plan is due on December 31, 2013 and this document will contain further information related to an EQC for TDS.

4.11 Strontium

Water quality objective: There is currently no guideline value for strontium although it is known to be toxic to aquatic life. Therefore, EcoMetrix derived a WQO of 0.5 mg/L for strontium based on the toxicity literature. With its response to interventions, De Beers submitted an evaluation of the strontium toxicity literature that questioned the validity of some of the published strontium toxicity studies and argued that if those questionable studies were not used, the WQO would be much higher (e.g., approximately 6.2 mg/L). Dr. Don Hart of EcoMetrix agreed that there was “some uncertainty with a critical study²⁹” and that closer look at the low data points was warranted. AANDC³⁰ pointed out that data outliers should not merely be identified based on being lower than other data points and they advocated for an assessment of all the strontium studies before deciding which ones should or should not be used for setting a WQO. Overall, the evidence was not strong enough to dismiss the Board’s concerns with strontium toxicity and WL MV2011L2-0004 requires a Strontium Response Plan as per Part F, Item 15 and Schedule 5, to assess the potential for source control of strontium and to derive a defensible site-specific strontium WQO. The Response Plan is due December 31, 2013 and there is a possibility that a site-specific WQO for strontium will be higher than the value derived by EcoMetrix.

EQC Derivation Based on Accepted WQO: EcoMetrix recommended a monthly average concentration of 0.5 mg/L strontium in order to maintain a water quality objective of 0.5 mg/L in Snap Lake until the end of mine life.

Achievability: This EQC is not achievable as the median values of strontium in the effluent are already at 1.61 mg/L.

Considerations of the Receiving Environment: De Beers’ 2011 water quality modelling³¹ does not predict strontium concentrations into the future. Figure A6-29 of the 2010 Snap Lake AEMP Annual Report shows that strontium concentrations in Snap Lake are increasing steadily over time. Strontium concentrations measured in at the edge of the mixing zone in 2010 were as high as 0.46 mg/L and were about 0.4 mg/L in the far-field.

Conclusion: There is no published water quality guideline for strontium. EcoMetrix derived a WQO for strontium based on literature toxicity values but both EcoMetrix and De Beers questioned the validity of some of the literature values. Therefore, the Board is unable to set a defensible water quality objective for strontium at this time. The water quality objective for

²⁹ Page 45, lines 20-21, Transcript of De Beers Snap Lake Public Hearing, December 14, 2011

³⁰ Page 26, line 12 to page 27, line 6, Transcript of the De Beers Snap Lake Public Hearing, December 15, 2011

³¹ Page 26, Water Quality Modelling Report, Golder Associates, dated June 2011 and submitted with De Beers’ renewal application on June 8, 2011 as Supporting Document 7

strontium as well as the need for a strontium EQC may be re-evaluated after the Board receives the Strontium Response Plan on December 31, 2013.

4.11 Phosphorus

Water quality objective: AANDC recommended a WQO for phosphorus of 0.005 mg/L based on guideline values from the British Columbia Ministry of Environment (BCMOE). However, median baseline concentrations in Snap Lake have been reported³² as 0.009 mg/L with maximum values reported as high as 0.026 mg/L. Therefore, the BCMOE guideline for phosphorus cannot reasonably apply to Snap Lake. There is no other evidence for a phosphorus WQO applicable to Snap Lake at this time.

EQC Derivation Based on Accepted WQO: Not possible to derive without a WQO.

Considerations of the Receiving Environment: Figure A6-21 of the 2010 Snap Lake AEMP Annual Report show no increasing trend in phosphorus concentrations over time in the near-field or far-field of Snap Lake. Concentrations of phosphorus in Snap Lake including the Northwest Arm remain at approximately 0.005 mg/L.

Conclusion: A concentration based EQC is not deemed necessary at this time. There was no evidence provided to change the loading limit for phosphorus and, therefore, the loading limit remains unchanged from MV2001L2-0002.

4.12 Sulphate

Water quality objective: AANDC recommended a WQO for sulphate of 50 mg/L based on guidance from the BCMOE. Environment Canada also reported³³ that they have a draft guideline for sulphate of 65 mg/L although this has not yet been finalized. As it is a published value, the WQO recommended by AANDC could reasonably be used at this time as the basis of deriving an EQC.

EQC Derivation Based on Accepted WQO: Sulphate was not identified during the technical sessions as a contaminant of potential concern and, therefore, the Board did not request that EcoMetrix derive an EQC for this parameter. AANDC calculated a monthly average EQC for sulphate by multiplying the WQO by 1.5 which they say is the “typical ratio of the EQC:WQO³⁴” in the EcoMetrix report. The EQC/WQO ratio for parameters modeled by EcoMetrix actually varies between 1.0 and 1.5 depending on the parameter because the model is based on a great deal of data regarding mine inputs to the lake, the effect of recirculation through the mine, outflow rates etc. Nonetheless, the use of the higher ratio of 1.5 is reasonable to

³² Table 5.1, Snap Lake Mine Site Water Quality Report, Golder Associates, dated June 2011 and submitted with De Beers' renewal application on June 8, 2011 as Supporting Document 6

³³ Page 132, line 18 to page 133, line 12, Transcript of the De Beers Snap Lake Public Hearing, December 15, 2011

³⁴ Page 10 of Appendix 1, AANDC Intervention to the De Beers Snap Lake Public Hearing, November 2011

estimate a monthly average and maximum grab concentrations of 75 and 150 mg/L respectively.

Achievability: The median, 90th percentile, and maximum concentrations of sulphate in the effluent are 45, 68 and 112 mg/L respectively. Therefore, the proposed EQC are currently achievable.

Considerations of the Receiving Environment: Figure A6-14 of the 2010 Snap Lake AEMP Annual Report shows a clear trend of sulphate concentrations increasing at about 3 mg/L per year since 2005 and concentrations in Snap Lake in 2010 were between 12 and 18 mg/L in all areas of Snap Lake. Thus, sulphate levels have reached almost 40 percent of the WQO of 50 mg/L in the lake. EC also expressed concern about sulphate levels in Snap Lake pointing out that “sulphate levels in treated effluent are increasing, and have exceeded EA predictions³⁵”. However, EC did not recommend setting an EQC for sulphate at this time, instead suggesting that De Beers investigate the sources of sulphate and continue monitoring the parameter.

Conclusion: Although not based on the EcoMetrix model, an EQC for sulphate has been recommended that is based on a reasonable WQO for Snap Lake and that is achievable. Given the increasing concentration of sulphate in Snap Lake, an EQC is warranted at this time. The maximum average and maximum grab EQC for sulphate will be 75 and 150 mg/L respectively.

5.0 EQC analysis of contaminants of potential concern that have not exceeded WQO in the effluent

In this section, EQC are considered for the parameters have not exceeded a WQO in the effluent or the lake and that are not predicted to do so in future.

5.1 Parameters that have EQC in MV2001L2-0002

The metals arsenic, cadmium, lead, nickel and zinc all had EQC in MV2001L2-0002 and these values are shown in Table 1. As also shown in Table 1, none of these metals has measured concentrations in the effluent higher than a recommended WQO and none are expected to exceed WQOs in Snap Lake. Of these 5 metals, only nickel is showing an increasing trend in Snap Lake as shown in Figure A6-27 of the 2010 Snap Lake AEMP Annual Report. The maximum concentration of nickel measured in 2010 was 0.028 mg/L which is almost 30% of the CCME Guideline value of 0.0956 mg/L.

Based on effluent and AEMP data since mine construction, EQC for arsenic, cadmium, lead and zinc may no longer be necessary; however, no party requested removing these regulated parameters in the renewal WL, MV2011L2-0004. The Board has decided to retain EQC for

³⁵ Section 3.1.6 of EC's Intervention to the De Beers Snap Lake Public Hearing, November 2011

arsenic, lead, nickel and zinc although some of these values have been amended as described below. The EQC for cadmium has been removed since cadmium concentrations in the effluent continue to be below the detection limit.

EcoMetrix recommended using the CCME Guideline values for WQOs for arsenic, lead, nickel and zinc; the Board has adopted these recommendations.

EcoMetrix recommended an EQC of 0.007 mg/L as a maximum average concentration for arsenic in order to maintain the arsenic WQO in Snap Lake. As shown in Table 1, this EQC is achievable under current operating conditions and the concentration of arsenic in the effluent is not expected³⁶ to increase over time. The EQC for arsenic will be 0.007 and 0.014 mg/L for maximum average and maximum grab concentrations, respectively, in MV2011L2-0004.

EcoMetrix recommended an EQC of 0.0048 mg/L as a maximum average concentration for lead in order to maintain the lead WQO in Snap Lake. This is the same as the EQC for lead in MV2001L2-0002. As shown in Table 1, this EQC is achievable under current operating conditions. Although the concentration of lead in the effluent is predicted³⁶ to increase over time, the concentration is not expected to exceed 0.0003 mg/L. The EQC for lead will be 0.005 and 0.01 mg/L for maximum average and maximum grab concentrations, respectively, in MV2011L2-0004.

EcoMetrix recommended an EQC of 0.14 mg/L as a maximum average concentration for nickel in order to maintain the nickel WQO in Snap Lake. However, as shown in Table 1, this EQC is higher than the current EQC of 0.05 mg/L and clearly the lower value is achievable under current operating conditions. The concentration of nickel in the effluent is not expected³⁶ to increase over time. The EQC for nickel will continue to be 0.05 and 0.1 mg/L for maximum average and maximum grab concentrations, respectively, in MV2011L2-0004.

EcoMetrix recommended an EQC of 0.04 mg/L as a maximum average concentration for zinc in order to maintain the zinc WQO in Snap Lake. However, as shown in Table 1, this EQC is higher than the current EQC of 0.01 mg/L and clearly the lower value is achievable under current operating conditions. Although the concentration of zinc in the effluent is predicted³⁶ to increase over time, the concentration is not expected to exceed 0.006 mg/L. The EQC for zinc will continue to be 0.01 and 0.02 mg/L for maximum average and maximum grab concentrations, respectively, in MV2011L2-0004.

The EQC for pH will remain unchanged from MV2001L2-0002 as will the loading limits for ammonia, nitrate and phosphorus.

³⁶ Table 9.4, Snap Lake Mine Site Water Quality Report, Golder Associates, dated June 2011 and submitted with De Beers' renewal application on June 8, 2011 as Supporting Document 6

5.2 Parameters that did not have EQC in MV2001L2-0002

The metals barium, boron, manganese, and molybdenum did not have EQC in MV2001L2-0002. Figures in Appendix 6 of the 2010 Snap Lake AEMP Annual Report show that the concentrations of all four of these metals are increasing in Snap Lake over time. The Board has considered the following information with respect to setting EQC for these parameters:

Barium: Maximum Barium concentrations are 7 percent of the EcoMetrix recommended WQO of 1 mg/L and shows no increasing trend in the effluent. Barium concentrations are predicted to approximately double in Snap Lake by 2022 (as shown in Figure 9 of the EcoMetrix report) but will remain below 5 percent of the WQO. EcoMetrix recommended a water quality-based EQC of 1.5 mg/L which is considerably higher than the 90th percentile concentration of 0.037 mg/L for manganese in the effluent. The Board has decided that this parameter does not need to be regulated at this time.

Boron: The 90th percentile and maximum concentrations of boron in the effluent are 8 and 30 percent respectively of the CCME Guideline value for boron of 1.5 mg/L. The concentration of Boron is predicted to double in the lake by 2022 (as shown in Figure 8 of the EcoMetrix report) but will remain below 7 percent of the WQO. EcoMetrix recommended a water quality-based EQC of 2.3 mg/L which is considerably higher than the 90th percentile concentration of 0.16 mg/L for boron in the effluent. The Board has decided that this parameter does not need to be regulated at this time.

Manganese: The maximum concentration of manganese in the effluent is 7 percent of the EcoMetrix recommended WQO of 1 mg/L. EcoMetrix predicts that manganese will increase in the lake until about 2022 but the maximum predicted value is less than 10 percent of the WQO. EcoMetrix recommended a water quality-based EQC of 1.5 mg/L which is considerably higher than the 90th percentile concentration of 0.07 mg/L for manganese in the effluent. The Board has decided that this parameter does not need to be regulated at this time.

Molybdenum: The 90th percentile and maximum concentrations of molybdenum in the effluent are 18 and 36 percent of the AANDC recommended WQO of 0.05 mg/L. In the June 2011 water quality modeling report by Golder, the maximum predicted concentration of molybdenum in Snap Lake is 0.0047mg/L which is about 10 percent of the WQO. EcoMetrix was not asked to recommend an EQC for molybdenum, but AANDC recommended 0.075 and 0.15 mg/L for maximum average and maximum grab EQC respectively. The 90th percentile concentration of molybdenum in the effluent is 0.009 mg/L so the recommended EQC is considerably higher. The Board has decided that this parameter does not need to be regulated at this time.

6.0 EQC For MV2011L2-0004

| Parameter | EQC in mg/L | |
|--|------------------------|---------------------|
| | Maximum Average | Maximum Grab |
| Total Suspended Sediments | 7 | 14 |
| Ammonia as N | 10 | 20 |
| Nitrite as N | 0.5 | 1 |
| Nitrate as N <i>(up to December 31, 2014)</i> | 22 | 44 |
| Nitrate as N <i>(from January 1, 2015)</i> | 4 | 8 |
| Chloride <i>(up to December 31, 2014)</i> | 310 | 620 |
| Chloride <i>(from January 1, 2015)</i> | 160 | 320 |
| Fluoride <i>(from January 1, 2015)</i> | 0.15 | 0.3 |
| Sulphate | 75 | 150 |
| Aluminum | 0.1 | 0.2 |
| Arsenic | 0.007 | 0.014 |
| Chromium | 0.01 | 0.02 |
| Copper | 0.003 | 0.006 |
| Lead | 0.005 | 0.01 |
| Nickel | 0.05 | 0.1 |
| Zinc | 0.01 | 0.02 |

Table 1: Comparison of Measured Effluent Concentrations with Recommended Water Quality Objectives

| | EQC in MV2001L2-0002 | Concentrations ³⁷ in Effluent SNP Data November 2008- August 2011 | | | | Recommended Water Quality Objectives | | 90 th Percentile or Maximum exceeds WQO? | Ratio of 90 th Percentile to lowest WQO |
|---|---|--|------------------------------------|----------------|---|--------------------------------------|----------------------------|---|--|
| | Maximum Average/Maximum Grab Conc. (mg/L) | Median (mg/L) | 90 th Percentile (mg/L) | Maximum (mg/L) | Number of measurement above 90 th Percentile | EcoMetrix ³⁸ (mg/L) | AANDC ³⁹ (mg/L) | | |
| <i>Parameters that have EQC in MV2001L2-0002</i> | | | | | | | | | |
| TSS | 7/14 | 3 | 8 | 18 | 17 | 5 | 5 | Yes | 1.6 |
| Ammonia as N | */20 | 1.73 | 4.34 | 9.56 | 18 | 1.47 | 1.47 | Yes | 3.0 |
| Nitrite as N | 1/2 | 0.16 | 0.29 | 0.67 | 14 | 0.06 | 0.06 | Yes | 4.8 |
| Nitrate as N | 28/56 | 5.7 | 19.12 | 55.56 | 18 | 3.61 | 3.61 | Yes | 5.3 |
| Aluminum | 1/2 | 0.024 | 0.109 | 0.194 | 9 | 0.1 | 0.05 | Yes | 2.2 |
| Arsenic | 0.02/0.04 | 0.00022 | 0.00086 | 0.002 | 8 | 0.005 | 0.005 | No | 0.2 |
| Cadmium | 0.001/0.002 | All measurements below method detection limit | | | | 0.000033 | 0.000033 | No | n/a |
| Chromium | 0.02/0.04 | 0.00067 | 0.0029 | 0.01 | 7 | 0.0089 | | Yes | 0.3 |
| Copper | 0.01/0.02 | 0.00079 | 0.0015 | 0.004 | 5 | 0.0024 | 0.0024 | Yes | 0.6 |
| Lead | 0.005/0.009 | 0.00016 | 0.00045 | 0.0011 | 6 | 0.0032 | 0.0032 | No | 0.1 |
| Nickel | 0.05/0.1 | 0.010 | 0.0155 | 0.040 | 9 | 0.0956 | 0.0956 | No | 0.2 |
| Zinc | 0.01/0.02 | 0.0023 | 0.0047 | 0.0088 | 6 | 0.03 | 0.015 | No | 0.3 |
| pH | 6.5-9.0 | 7.69 | 7.85 | 8.3 | 18 | 6.5-9.0 | 6.5-9.0 | No | |
| <i>Parameters that have or may exceed WQOs in Snap Lake</i> | | | | | | | | | |
| Fluoride | | 0.39 | 0.48 | 0.58 | 16 | 0.4 | 0.4 | Yes | 1.2 |
| Chloride | | 247.0 | 284.5 | 325.0 | 15 | 213 | 150 | Yes | 1.9 |
| TDS | | 552.0 | 648.6 | 937.0 | 17 | 350 | 350 | Yes | 1.9 |
| Manganese | | 0.051 | 0.070 | 0.096 | 9 | 1 | 1 | No | 0.07 |
| <i>Parameters that have an increasing trend in Snap Lake</i> | | | | | | | | | |
| Barium | | 0.031 | 0.037 | 0.066 | 9 | 1 | 1 | No | 0.04 |
| Boron | | 0.098 | 0.160 | 0.420 | 9 | 1.5 | 1.2 | No | 0.1 |
| Strontium | | 1.61 | 1.75 | 1.94 | 8 | 0.5 | | Yes | 3.5 |
| <i>Additional parameters recommended for EQC by AANDC</i> | | | | | | | | | |
| Phosphorus | | 0.006 | 0.0144 | 0.0191 | 15 | | 0.005 | Yes | 2.9 |
| Sulphate | | 45.5 | 68.3 | 112.0 | 21 | | 50 | Yes | 1.4 |
| Molybdenum | | 0.0038 | 0.0079 | 0.0184 | 5 | | 0.050 | No | 0.2 |

³⁷ For the calculations, data at less than the detection limit was assigned a value equal to the detection limit.

³⁸ See EcoMetrix Memo of October 19, 2011 for derivation of recommended WQOs

³⁹ See AANDC Intervention dated November 7, 2011

Table 2: Calculation of Assimilation Rates for Ammonia and Nitrate in the Mixing Zone

| Parameter | Average concentration of effluent (SNP 02-17b) in 2010 (mg/L) | Maximum measured concentration at edge of mixing zone (SNP 02-20) in 2010 (mg/L) | Estimated Assimilation Ratio ([Average Effluent]/[Maximum at Edge of Mixing Zone]) |
|-----------|---|--|--|
| Ammonia | 2.4 | 0.297 | 8.1 |
| Nitrite | 0.21 | 0.0214 | 9.81 |

Table 3: Calculation of Current Dilution Rates for Chloride and Nitrate Interim EQC

| Parameter | Average concentration of effluent (SNP 02-17b) in 2010 (mg/L) | Maximum measured concentration at edge of mixing zone (SNP 02-20) in 2010 (mg/L) | Estimated Dilution Ratio ([Average Effluent]/[Maximum at Edge of Mixing Zone]) |
|-----------|---|--|--|
| Nitrate | 10.5 | 1.77 | 5.9 |
| Chloride | 239 | 91.5 | 2.6 |

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