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Environmental Monitoring Advisory Board

REVISED REVIEW OF SITE-SPECIFIC RISK-BASED CLOSURE CRITERIA (SSRBCC) USED IN DIAVIK'S VERSION 4.0 OF ITS CLOSURE AND RECLAMATION PLAN (CRP)

December 2017

REVISED REVIEW OF SITE-SPECIFIC RISK-BASED CLOSURE CRITERIA (SSRBCC)

Diavik Version 4.0 Closure and Reclamation Plan

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EXECUTIVE SUMMARY

The Diavik Diamond Mine (Mine) is a joint venture between Rio Tinto and Dominion Diamond Diavik Limited Partnerships, with Rio Tinto being the operating manager. The Mine is located on East Island, a 17 square kilometer (km^2) island in Lac de Gras, Northwest Territories (NT), located approximately 300 km northeast of Yellowknife. The area is remote, and is accessed by a seasonal winter road or by aircraft.

Closure activities are anticipated to begin around mid-2025 following the end of commercial operations at the Site. Diavik is proposing progressive reclamation for some areas of the Mine which is the process of starting closure activities concurrent with ongoing operations and before the end of the commercial production.

Arcadis Canada Inc (Arcadis) conducted a review for the Environmental Monitoring Advisory Board (EMAB) of the Site-Specific Risk-Based Closure Criteria (SSRBCC) presented in Version 4.0 of Diavik's Closure and Reclamation Plan (CRP). The CRP is a document summarizing the current plans for closure, and it is recognized that it is an iterative document building on the initial closure plan, until the final closure plan is achieved and granted regulatory acceptance.

Arcadis completed a technical review of the SSRBCC Diavik has used for the CRP contained within the CRP Version 4.0 and Appendices 1-XIII. Arcadis provides comments on the following for each mine component:

- Whether previous comments and recommendations made by Arcadis on behalf of EMAB regarding the SSRBCC have been made and if there are any continuing concerns regarding revisions or approaches taken in the derivation of the SSRBCC.
- If previous SSRBCC have been amended or if new SSRBCC have been proposed, then Arcadis will comment on:
    - The defensibility of the methodology used to derive or select the SSRBCC;
    - Whether all Contaminants of Potential Concern (COPCs), contaminant pathways and receptors were identified; and
    - Any aspects of the SSRBCC not considered by Diavik.

Specific closure goals were developed through a process with DDMI, reviewers and WLWB staff. They are outlined below:

- Land and water that is physically and chemically stable and safe for people, wildlife and aquatic life;
- Land and water that allows for traditional use;
- Final landscape guided by traditional knowledge;
- Final landscape guided by pre-development conditions;
- Final landscape that is neutral to wildlife – being neither a significant attractant nor significant deterrent relative to pre-development conditions;
- Maximize northern business opportunities during operations and closure;

- Develop northern capacities during operations and closure for the benefit of the north, post-closure; and
- Final site conditions that do not require a continuous presence of Mine staff.

In addition, the WLWB have specified that the Indian and Northern Affairs Canada (INAC) policy goal also applies to the mine Site. The policy goal states: “Returning mine site and affected areas to viable and, wherever practical, self-sustaining ecosystems that are compatible with a healthy environment and with human activities”.

The review by Arcadis concluded that transparency of the approach taken for the development of SSRBCC needs to be clearer. Summary tables for each media should be provided that illustrates, for every parameter, the receptors concerned, the risk-based targets for each of the receptors, and then the selection of the most stringent risk-based target level as the overall SSRBCC, with a rationale provided. The presentation of the information in this manner would increase transparency, would make the process clearer and can help to demonstrate that all receptors have been considered.

Issues regarding the identification of COPCs have been identified previously. Diavik has indicated that for parameters not identified as COPCs that the CCME EQG would be defaulted to as closure criteria. This approach is acceptable for the protection of plants, terrestrial invertebrates, terrestrial mammals and birds, humans and aquatic receptors (plants, invertebrates and fish). It is however, not protective of receptors that would be exposed to surface water as drinking water, for consumption of fish and for prey and for sediment contact with humans, birds or mammals.

Concerns remain unresolved with regards to the methodology and approaches taken in the selection of SSRBCC and transparency would facilitate review and approval of SSRBCC.

1 INTRODUCTION

Arcadis Canada Inc (Arcadis) conducted a review for the Environmental Monitoring Advisory Board (EMAB) of the Site-Specific Risk-Based Closure Criteria (SSRBCC) presented in Version 4.0 of Diavik's Closure and Reclamation Plan (CRP). The CRP is a document summarizing the current plans for closure, and it is recognized that it is an iterative document building on the initial closure plan, until the final closure plan is achieved and granted regulatory acceptance.

Diavik submitted the CRP (and its associated appendices and figures) to the Wek'èezhíi Land and Water Board (WLWB) on April 20, 2017. The WLWB completed their conformity check with the Water License and distributed the CRP for Review on May 19, 2017, with comments due by October 19, 2017.

1.1 Scope of Work

Arcadis is to complete a technical review of the SSRBCC Diavik has used for the CRP contained within the CRP Version 4.0 and Appendices 1-XIII. Arcadis will provide comments on the following for each mine component:

- Whether previous comments and recommendations made by Arcadis on behalf of EMAB regarding the SSRBCC have been made and if there are any continuing concerns regarding revisions or approaches taken in the derivation of the SSRBCC.
- If previous SSRBCC have been amended or if new SSRBCC have been proposed, then Arcadis will comment on:
    - The defensibility of the methodology used to derive or select the SSRBCC;
    - Whether all Contaminants of Potential Concern (COPCs), contaminant pathways and receptors were identified; and
    - Any aspects of the SSRBCC not considered by Diavik.

Arcadis previously completed a review of the North Country Rock Pile-Waste Rock Storage Area (NCRP-WRSA) final closure plan, and the review comments will not be repeated within this report. Detailed comments on the SSRBCC review for the CRP are presented in the excel sheet provided by the WLWB as Table 1 attached to this report and are summarized herein. In addition, Arcadis has responded to the response to comments made by Diavik in the concordance table for the initial review of the Phase One and Phase Two reports (Table 2).

2 BACKGROUND

The Diavik Diamond Mine (Mine) is a joint venture between Rio Tinto and Dominion Diamond Diavik Limited Partnerships, with Rio Tinto being the operating manager. Diavik Diamond Mines (2012) Inc. (DDMI) is a wholly owned subsidiary of Rio Tinto plc of London, England. DDMI is the Manager and is the corporate entity responsible for the Mine activities (DDMI, 2017).

The Mine is located on East Island, a 17 square kilometer (km^2) island in Lac de Gras, Northwest Territories (NT), located approximately 300 km northeast of Yellowknife. The area is remote, and is accessed by a seasonal winter road or by aircraft.

All mining activities including diamond recovery, support activities and infrastructure are limited to the East Island.

Local communities are comprised of the Community of Wekweètì, Lutsel K'e, Bathurst Inlet Lupin mine site, Behchoko, Whati, Gameti, Kugluktuk and Yellowknife, including the NSMA (North Slave Metis Alliance).

The updated CRP has been prepared as per the requirements of DDMI's Class "A" Water License (WL2015L2-0001) and directives from the WLWB. Version 4.0 of the CRP (dated April 2017) is an update to the currently approved Interim Closure and Reclamation Plan (ICRP) Version 3.2, dated August 2011. The updated CRP (V4.0) contains a summary of the closure plan for each area of the Mine, as well as the most recent changes to the closure plans, closure objectives and initial criteria that have been proposed by Diavik to describe how each objective could be evaluated (DDMI, 2017).

3 CLOSURE AND RECLAMATION GOALS

DDMI's overall goal is "to operate and close the Diavik Mine responsibly, leaving behind a positive community and environmental legacy" (DDMI, 2017).

Specific closure goals were developed through a process with DDMI, reviewers and WLWB staff. They can be found in Table 5-1 of DDMI (2017) and are outlined below:

- Land and water that is physically and chemically stable and safe for people, wildlife and aquatic life;
- Land and water that allows for traditional use;
- Final landscape guided by traditional knowledge;
- Final landscape guided by pre-development conditions;
- Final landscape that is neutral to wildlife – being neither a significant attractant nor significant deterrent relative to pre-development conditions;
- Maximize northern business opportunities during operations and closure;
- Develop northern capacities during operations and closure for the benefit of the north, post-closure; and
- Final site conditions that do not require a continuous presence of Mine staff.

In addition, the WLWB have specified that the Indian and Northern Affairs Canada (INAC) policy goal also applies to the mine Site. The policy goal states: "Returning mine site and affected areas to viable and, wherever practical, self-sustaining ecosystems that are compatible with a healthy environment and with human activities".

Closure activities are anticipated to begin around mid-2025 following the end of commercial operations at the Site. Diavik is proposing progressive reclamation for some areas of the Mine which is the process of starting closure activities concurrent with ongoing operations and before the end of the commercial production.

Five closure management areas have been defined for the Mine as follows:

1. Waste Rock and Till Storage Area;
2. Processed Kimberlite Containment (PKC) Area;
3. Open Pits, Underground and Dike Area;
4. North Inlet (NI) Area; and
5. Mine Infrastructure.

3.1 Closure Objectives

The requirements for closure of a mine are driven by closure goals and closure objectives, which are measured/defined by closure criteria. Closure goals are broad statements of outcome of the closure. Closure criteria help to define the objective and are used to measure if the objectives have been achieved.

DDMI has also developed more specific closure objectives that are either site-wide (apply to all 5 closure management areas) or area-specific. These are summarized in Table 1 below and are found in Table 5-2 DDMI Closure Objectives of the DDMI report (2017). Closure objectives that are bolded in Table 1 below are measured to an extent by the SSRBCC that are the subject of Arcadis' review.

Table 1: DDMI Closure Objectives

Number/ Location	Closure Objective	SBRCC Criteria Applied
Site-Wide Closure Objectives		
SW1	**Surface runoff and seepage water quality that is safe for humans and wildlife.**	Human (Table V-8); Bird (Table V-9); Mammals; Table V-10 or the results of a detailed risk assessment
SW2	**Surface runoff and seepage water quality that will not cause adverse effects on aquatic life or water uses in Lac de Gras or the Coppermine River.**	Surface runoff/seepage closure criteria for protection of aquatic life (Table V-7) or results of site specific risk assessment
SW3	**Dust levels safe for people, vegetation, aquatic life and wildlife.**	Mean TSP concentrations less than 60 µg/m^3 annual and 120 µg/m^3 24 hr maximum acceptable (Canadian Ambient Air Quality Objectives and NT Ambient Air Quality Standards); or results of a detailed Risk Assessment

Table 1: DDMI Closure Objectives (Cont'd)

Number/ Location	Closure Objective	SBRCC Criteria Applied
SW4	Dust levels do not affect palatability of vegetation to wildlife.	None
SW5	Re-vegetation targeted to priority areas.	None
SW6	Ground surface designed to drain naturally follow pre-development drainage patterns.	None
SW7	Areas in and around the Mine that are undisturbed during operation of the Mine should remain undisturbed during and after closure.	None
SW8	No increased opportunities for predation of caribou compared to pre-development conditions.	None
SW9	Landscape features (topography and vegetation) that match aesthetics and natural conditions of the surrounding natural areas.	None
SW10	Safe passage and use for caribou and other wildlife.	None
SW11	Mine areas are physically stable and safe for use by people and wildlife.	None
Area-Specific Closure Objectives		
1. Waste Rock and Tillage Storage Area		
W1	Physically stable slopes to limit risk of failure that would impact the safety of people or wildlife.	None
W2	Rock and till pile features (shape and appearance) that match aesthetics of the surrounding natural area.	None
W3	**Contaminated soils and waste disposal areas that cannot contaminate land and water.**	Does not indicate in Appendix V what criteria are proposed to measure this. NCRP-WRSA reviewed under separate cover.
2. Processed Kimberlite Containment Area		
P1	**No adverse effects on people, wildlife or vegetation.**	Human (Table V-8); Bird (Table V-9); Mammals; (Table V-10) and soils (Table V-11) or the results of a detailed risk assessment
P2	Physically stable Processed Kimberlite Containment area to limit risk of failure that would affect safety of people or wildlife.	None
P3	Prevent processed kimberlite from entering the surrounding terrestrial and aquatic environments.	None

Table 1: DDMI Closure Objectives (Cont'd)

Number/ Location	Closure Objective	SBRCC Criteria Applied
3. Open Pit, Underground and Dike Area Closure Objectives		
M1	**Water quality in the flooded pit and dike area that is similar to Lac de Gras or, at a minimum, protective of aquatic life.**	AEMP Benchmark or result of a detailed risk assessment
M2	**Pit and dike closure that do not have adverse effects on water uses in Lac de Gras, the Coppermine River or groundwater use.**	AEMP Benchmark or result of a detailed risk assessment
M3	Enhanced lake-wide fish habitat to offset fish habitat temporarily lost during operations.	None
M4	Safe small craft navigation through dike and pit area.	None
M5	Physically stable pit walls and shorelines to limit risk of a failure impacting people, aquatic life or wildlife.	None
M6	Pit fill rate that will not cause adverse effects on water levels in Lac de Gras and Coppermine River.	None
M7	Pit fill rate that will not cause adverse effects on fish or fish habitat in Lac de Gras and Coppermine River.	None
M8	Wildlife safe during filling of pits	None
4. North Inlet Area Closure Objectives		
NI2	**Water quality and sediment quality in the North Inlet that is safe for aquatic life, wildlife, and people.**	AEMP for water quality, Sediment and Birds (Table 12), Sediment for Aquatic Life (Table 13 (to join NI with Lac de Gras) or the results of a detailed risk assessment
NI3	**Suitable fish habitat in the North Inlet.**	AEMP Benchmark, Sediment and Birds (Table V-12), Sediment for Aquatic Life (Table 13) – (to join NI with Lac de Gras) or the results of a detailed risk assessment
NI4	Water quality in the North Inlet that is as similar to Lac de Gras as possible.	None
NI5	**Water and sediment quality in the North Inlet that will not cause adverse effects on aquatic life or water uses in Lac de Gras or the Coppermine River.**	AEMP benchmark or results of detailed risk assessment
NI6.	Physically stable banks of the North Inlet to limit risk of failure that would impact the safety of people or wildlife.	None
5. Mine Infrastructure Closure Objectives		
I1	Opportunities for communities to re-use infrastructure, allowable under regulation and where liability is not a significant concern.	None
I2	On-site disposal areas that are safe for people, wildlife and vegetation.	Surface runoff/seepage closure criteria for the protection of aquatic life (Table V-7), Drinking Water Closure Criteria (Table V-8), Water

Table 1: DDMI Closure Objectives (Cont'd)

Number/ Location	Closure Objective	SBRCC Criteria Applied
		Closure Criteria for Birds (Table V-9), Water closure criteria for mammals (Table V-10), Soil Closure Criteria (Table V-11) or the results of a detailed risk assessment
I3	Prevent remaining infrastructure from contaminating land or water.	Surface runoff/seepage closure criteria for the protection of aquatic life (Table V-7), Drinking Water Closure Criteria (Table V-8), Water Closure Criteria for Birds (Table V-9), Water closure criteria for mammals (Table V-10), Soil Closure Criteria (Table V-11) or the results of a detailed risk assessment

WLWB approved the closure objectives provided in the ICRP V3.2, but did not approve the closure criteria as additional discussions and time were required. In addition, DDMI submitted a final closure plan for the NCRP-WRSA so they could proceed with progressive reclamation. It is Arcadis' understanding that the plan was not approved and that some additional explanations/concerns need to be addressed.

DDMI suggests that the approaches for closure criteria to be used in the NCRP-WRSA will inform the closure criteria for the other management areas of the Site and that it would be inefficient for DDMI or stakeholders to focus on criteria from other areas (DDMI, 2017). However, the EMAB would like the proposed closure criteria, that are based on the SSRBCC to be reviewed at this time.

3.2 Contaminants of Potential Concern Selection Process and Conceptual Site Models

The selection of COPCs and the human health and ecological conceptual site models that form the basis for the derivation of the SSRBCC is outlined in the Site-Specific Risk-Based Closure Criteria Phase I Report (hereafter referred to as the Phase I Report) dated November 2016 that was included as Appendix X-8-1 of the CRP V4.0. Please note the original submission of the CRP V4.0 had a previous version of the Phase I report, but since the two reports have the same date and do not provide a revision date or version number, reference to the Phase I report will be to the updated Phase I report and not the one originally submitted with the CRP V4.0.

Numerous concerns regarding the identification of COPCs in the original submission of the Phase I report were made and were not adequately addressed by Diavik. The approach taken is not conventional and will result in missing COPCs that should have SSRBCC developed. However, Diavik has committed to setting closure criteria for all parameters not identified as COPCs to the applicable CCME Environmental Quality Guidelines (EQG). This approach mitigates concerns regarding the COPC selection for most receptors and therefore no additional comments were made, unless the approach was non-protective for some receptors supposed to be considered.

EMAB should however confirm the following:

- That for the protection of human health, the CCME EQGs and Health Canada's drinking water quality guidelines will be used as the closure criteria in the absence of SSRBCCs.
- For receptors where the CCME EQG are not derived to be protective of receptors being considered under the closure objective, how will Diavik ensure the protection of these species when defaulting to the CCME EQGs. For example, defaulting to the CCME Water Quality Guidelines for the Protection of Aquatic Life will not be protective of aquatic birds or mammals or organisms consuming fish or biota.
- The approach taken for parameters that are associated with mining activities but are without applicable CCME or Health Canada's guidelines. It is not clear how will Diavik set the closure criteria for parameters without CCME EQG and for which SSRBCC were not derived. Clarification should be sought from Diavik.

The ecological conceptual Site model (CSM) provided in Figure 2.5-1 of the Phase I report has too much information contained within it resulting in the lack of clarity regarding complete exposure pathways for each management area and each receptor of concern (ROC). It is suggested that separate ecological CSMs for each management area be provided so that the exposure pathways and receptors are clearly outlined.

The ecological CSM also indicates that exposure to ecological receptors from food is not considered a complete exposure pathway. For higher trophic levels, this approach is not acceptable and must be considered. This will affect the setting of the SSRBCC and the SSRBCC for higher trophic level organisms will not be protective.

Arcadis did not complete a detailed review of the COPC selection process as the approach has not changed and the concerns regarding the approach have already been voiced.

The human health CSM (Figure 2.5-2) is missing some relevant exposure pathways, which although not considered the main exposure pathway, will contribute to human exposure and should be considered in the derivation of the SSRBCC. These pathways include dermal contact to soil, sediment and water and inhalation of particulate matter.

3.3 Site Specific Risk-Based Closure Criteria

DDMI indicates in Section 5.2.2 of their report that the approach taken in the derivation of the SSRBCC have been revised to address concerns raised by the reviewers and that these revised reports were included in the submission of the Closure and Reclamation Plan V4.0 as Appendix X-8.1 and X-8.2. However, the original Phase I and Phase II reports on the derivation of the SSRBCC were included in the submission and not the revised reports. These reports along with a concordance table were submitted at a subsequent date and are included in this review.

4 SUMMARY OF REVIEW COMMENTS FOR RISK-BASED CLOSURE CRITERIA (SSRBCC)

Arcadis has summarized the major concerns/comments regarding each of the SSRBCC derived by Diavik below. Any specific comments remaining can be found in Table 1 attached to this document.

4.1 Closure Water Quality Criteria – Protection of Aquatic Life (Table V-7)

Diavik has proposed Closure Water Quality Criteria for the Protection of Aquatic Life to measure the following site-wide and area specific objectives:

- SW2 - Surface runoff and seepage water quality that will not cause adverse effects on aquatic life or water uses in Lac de Gras or the Coppermine River; and
- I2 - On-site disposal areas that are safe for people, wildlife and vegetation.

Diavik has indicated that the approach proposed in Appendix X-8.1 and X-8.2 (the Phase I and Phase II Reports) for aquatic receptors will not be relied upon, and that the approach contained in the NCRP-WRSA will be used. The approach proposed for setting the closure criteria protective of aquatic life includes a mixing zone of 1 km from the shore of the island, a dilution factor of 86 and the application of a 20% effects level. Arcadis previously reviewed the derivation of the closure water quality criteria for the protection of aquatic life during our review of the NCRP-WRSA closure plan. The detailed comments will not be provided again herein, please refer to the comments provided by EMAB on the NCRP-WRSA Closure Plan with respect to the derivation of the closure criteria. Arcadis has, however, summarized the key points of our concerns as well as completed a comparison of the proposed criteria in the CRP V4.0 with the proposed criteria in NCRP-WRSA Closure Plan (found in Appendix V Table V-1). Based on this summary and comparison, we provide the following:

- A number of the proposed Surface runoff/seepage Closure Criteria for the Protection of Aquatic Life in the NCRP-WRSA closure plan are inconsistent with the values proposed in the CRP V4.0. Diavik should provide a rationale for these differences as the SSRBCC should be designed to be protective of the same receptors. Examples of parameters with different SSRBCC proposed include but are not limited to silver, copper, nickel and zinc.
- Differences between the COPCs between the NCRP-WRSA and the CRP V4.0 also exist, and the rationale is not clear. For example, the inclusion or exclusion of unionized ammonia in the derivation of SSRBCC is not clear.
- The back calculated criteria that are proposed for closure criteria for the NCRP-WRSA are an order of magnitude (or more) greater than the concentrations protective of aquatic life. Given that these elevated concentrations are proposed to be applicable for a 1 km mixing zone from the shore of the island, adverse effects to aquatic receptors would be expected, thus making DDMI's closure objectives unattainable with these criteria.
- DDMI has proposed the MMER as closure criteria for some parameters including nickel and unionized ammonia. The MMER are not designed to be protective of the aquatic environment, but

are instead regulatory discharge limits that a point source effluent must meet and demonstrate the absence of acute toxicity at the discharge point. The Environmental Effects Monitoring (EEM) program together with chronic toxicity testing is used to support the MMER and to demonstrate the absence of adverse effects.

- The approach used to develop the SSRBCC in Table V-7 is the same approach used for the NCRP-WRSA. Therefore, comments pertaining to the Effects Magnitude and Dilution Factor previously made in the review of the NCRP-WRSA applies here. Briefly, a 1 km mixing zone, the dilution factor applied and the effects magnitude do not appear to be protective of the Aquatic Environment.
- The approach used to develop the SSRBCC in Table V-7 does not consider the protection of higher trophic organisms, and would only consider the protection of aquatic invertebrates, plants and fish. Consideration of the protection of aquatic birds and mammals has not been given.

In summary, the closure criteria proposed in Table V-7 to be protective of aquatic life from seeps and surface water run-off and for on-site disposal areas will not be protective of aquatic receptors and major revisions to the approach for the derivation of these closure criteria is required.

4.2 Drinking Water Closure Criteria (Table V8)

The Drinking Water Closure Criteria provided in Table V8 were developed to measure the following closure objectives:

- SW1 – Surface runoff and seepage water quality that is safe for humans and wildlife;
- P1 – (Processed Kimberlite Containment Area): No adverseaffects on people, wildlife or vegetation;
- I2 (Mine Infrastructure Areas): On-site disposal areas are safe for people, wildlife and vegetation; and
- I3 (Mine Infrastructure Areas): Prevent remaining infrastructure from contaminating land or water.

Specific comments regarding the drinking water closure criteria are provided in Table 1 attached to this report. In general, none of the SSRBCC for drinking water provided in Appendix K of the Phase II report correspond with the SSRBCC for drinking water provided in Table V-8 of the CRP V.0. It is not clear which of the SSRBCC Diavik intends to rely upon, those provided in Table V-8 or those provided in Table 2.4-12 of Appendix X-8.1.

As the drinking water quality guidelines are protective of humans consuming water as potable water, it is not clear how or why values significantly below Health Canada's drinking water guidelines were calculated (such as drinking water closure criteria for toddlers for antimony, the SSRBCC was calculated as 0.00662 mg/L). Additional rationale into the derivation of the SSRBCC must be provided to make the process more transparent.

The majority of the parameters have SSRBCC set at Health Canada's drinking water guidelines. The use of Health Canada's drinking water guidelines as SSRBCC will provide the level of protection required to meet the closure objective. Diavik should be encouraged to set the closure criteria for water protective of human health to Health Canada's drinking water guidelines.

For Mine related parameters without Health Canada drinking water quality guidelines, and for which parameters were not identified as COPCs, it is unclear what closure criteria Diavik will use to assess meeting the closure objective. Clarification from Diavik should be obtained prior to accepting the closure criteria.

4.3 Water Closure Criteria for Birds (Table V9)

The Water Closure Criteria for birds provided in Table V9 were developed to measure the following closure objectives:

- SW1 – Surface runoff and seepage water quality that is safe for humans and wildlife;
- P1 – (Processed Kimberlite Containment Area): No adverse effects on people, wildlife or vegetation;
- I2 (Mine Infrastructure Areas): On-site disposal areas are safe for people, wildlife and vegetation; and
- I3 (Mine Infrastructure Areas): Prevent remaining infrastructure from contaminating land or water.

Specific comments relating the SSRBCC proposed for the protection of birds through contact with water are provided in Table 1 attached, and are summarized below.

The closure criteria provided in Table V9 of the CRP V4.0 do not correspond to the closure criteria provided in Appendix J of the Phase II Report table entitled Water SSRBCC for Birds found in Appendix X.8-2. Diavik needs to clarify which closure criteria will be used.

In addition, a discussion is not provided of how Diavik intends to protect birds from surface water contact for those parameters that are Mine-related but were not identified as COPCs because of the COPC screening approach used. The CCME EQG do not consider the exposure parameters in water or food in the derivation of the CCME Aquatic Protection Guidelines.

4.4 Water Closure Criteria for Mammals (Table V10)

The Water Closure Criteria protective of mammals provided in Table V10 were developed to measure the following closure objectives:

- SW1 – Surface runoff and seepage water quality that is safe for humans and wildlife;
- P1 – (Processed Kimberlite Containment Area): No adverse effects on people, wildlife or vegetation;
- I2 (Mine Infrastructure Areas): On-site disposal areas are safe for people, wildlife and vegetation; and
- I3 (Mine Infrastructure Areas): Prevent remaining infrastructure from contaminating land or water.

The ROCs and SSRBCC proposed in Table V10 are not consistent with those provided in Appendix I of Appendix X.8-2 for Closure Criteria for Mammals. Diavik should update the tables to be consistent. For parameters that are Site related but that were not identified as COPCs because of the screening process

used, Diavik should provide an indication of how the defaulted closure criteria would be protective of mammal exposure to water as this pathway is not considered in the derivation of the CCME Water Quality Guidelines and may not have values derived for the protection of livestock watering.

4.5 Soil Closure Criteria (Table V11).

The Soil Closure Criteria provided in Table V11 were developed to measure the following closure objectives:

- P1 – (Processed Kimberlite Containment Area): No adverse effects on people, wildlife or vegetation;
- I2 (Mine Infrastructure Areas): On-site disposal areas are safe for people, wildlife and vegetation; and
- I3 (Mine Infrastructure Areas): Prevent remaining infrastructure from contaminating land or water.

They are designed to be protective of both human health and wildlife exposed to surface material at the mine.

Aluminum in soil was considered a COPC in Appendix X.8-2 Table 3.1-1, and in Appendices I, J and K but not in Table V11. Clarification is required.

The SSRBCC that were derived for soil are essentially set at or very near to the CCME Soil Quality Guidelines for Residential/Parkland and Agricultural Land Use and therefore should be adequate to meet the closure objectives of being protective of human health and most ecological receptors. Consideration of SAR species must be given in the derivation of the final SSRBCC propose by Diavik. The protection of SAR through the food and ingestion pathway must be considered in the setting of the SSRBCC. For example, basing the final SSRBCC on the CCME EQG for chromium would not be protective of SAR species as a soil and food component value for chromium was not considered in the derivation of the CCME SQG.

4.6 Sediment Closure Criteria for Birds

The sediment closure criteria protective of birds are developed to measure the following closure objectives:

- NI2 (North Inlet) – Water quality and sediment quality in the North Inlet that is safe for aquatic life, wildlife and people; and
- NI3 (North Inlet) – Suitable Fish Habitat in the North Inlet.

The SSRBCC for sediment protective of birds is provided in Table V12. Table 3.3-1 Indicates the SSRBCC selected for sediment. It is not clear why the sediment values protective of birds have not been included in this table. For example, the SSRBCC in sediment for arsenic of 5.9 mg/kg dw is indicated to be driven by the protection of the Semipalmated Sandpiper. However, Table V12 indicates that an arsenic concentration of 0.5 mg/kg dw in sediment would be protective of the sandpiper. The process used to derive the SSRBCC is not clear.

It is also not clear for Site related parameters that were not identified as COPCs because of the screening methodology employed, how Diavik will set closure criteria for parameters not identified as COPCs. It should be noted that the CCME sediment quality guidelines are not protective of birds, mammals or human exposure to sediment. Diavik should provide a methodology for determining the default closure criteria for parameters not identified as COPCs.

4.7 Sediment Closure Criteria for Aquatic Life

The sediment closure criteria protective of aquatic life are developed to measure the following closure objectives:

- NI2 (North Inlet) – Water quality and sediment quality in the North Inlet that is safe for aquatic life, wildlife and people; and
- NI3 (North Inlet) – Suitable Fish Habitat in the North Inlet.

The sediment closure criteria for the protection of aquatic life was set to the CCME Interim Sediment Quality Guidelines. These SSRBCC are adequate to meet the portion of the objectives to be protective of aquatic life (aquatic plants, invertebrates and fish).

For Site related parameters that were not identified as COPCs and that are without CCME interim sediment quality guidelines, Diavik needs to provide an approach of identifying closure criteria that will be used to measure the above closure objectives.

5 SUMMARY OF METHODOLOGY/APPROACH

In general, the derivation of SSRBCC for setting closure criteria for soil, water and sediment is a defensible approach routinely used, provided the process is transparent and has considered all potential exposure pathways and all potential receptors.

Concerns regarding the identification of COPCs have been identified previously. Diavik has indicated that for parameters not identified as COPCs that the CCME EQG would be defaulted to as closure criteria. This approach is acceptable for the protection of plants, terrestrial invertebrates, terrestrial mammals and birds, humans and aquatic receptors (plants, invertebrates and fish). It is however, not protective of receptors that would be exposed to surface water as drinking water, for consumption of fish and for prey and for sediment contact with humans, birds or mammals. Diavik needs to provide an approach or rationale for how the CCME EQG would be protective of the receptors in these situations that are not considered in the derivation of the CCME EQG but are meant to be protected by the closure objective.

The transparency of the approach taken needs to be clearer. Summary tables for each media should be provided that illustrates, for every parameter, the receptors concerned, the risk-based targets for each of the receptors, and then the selection of the most stringent risk-based target level as the overall SSRBCC, with a rationale provided. The presentation of the information in this manner would increase transparency, would make the process clearer and can help to demonstrate that all receptors have been considered.

6 REFERENCES

DDMI (2017). Closure and Reclamation Plan – Version 4.0. Diavik Diamond Mines (2012) Inc. Dated April 2017.

ICRP Interim Closure and Reclamation Plan (2017). Diavik Diamond Mines (2012) Inc. Dated April 2017.

ATTACHMENT 1: SSRBCC CONFORMANCE ARCADIS COMMENTS

			GENERAL INSTRUCTIONS FOR EXCEL TEMPLATE: **1. Do not leave blank rows above or between comments.** **2. Do not modify the instructions or the column headings (i.e. the top three rows).** **3. Each comment must have a response.** **4. All formatting will be lost when this file is uploaded to the Online Comment Table.** **5. If necessary, adjust the cell width and height in order to view all text.**		**Responses should be as specific as possible, referring directly to the Comment/Recommendation.**			Arcadis Comments
ID	**Reviewer**	**Topic**	**Comment**	**Recommendation**	**Proponent Response**	**References/Link to memo**	**Location in reports**	
ECCC-2	Environment and Climate Change Canada: Bradley Summerfield	Closure objectives	Appendix V of the ICRP (version 3.2) provides tabular summaries of closure objectives and criteria. The closure objectives related to aquatic life include: - SW2 (site wide objective), which corresponds to the closure criteria "Table V-7 water entering LDG criteria or site-specific risk-based criteria met." - M1 (flooded pit and dike area objective), which corresponds to the closure criteria "Table V-7 aquatic life and drinking water criteria or site-specific risk-based criteria met." - M2 (pit and dike closure objective), which corresponds to the closure criteria "Water licence discharge criteria (EQC) or site-specific risk-based criteria met." - W3 (wasterock and till area objective), which correspond to the closure criteria "CCME contaminated sites guidelines or site-specific risk-based criteria for hydrocarbons are met" - NI2, NI3 and NI5 (North Inlet area objectives), which correspond to the closure criteria "Water and sediment quality that meets site-specific risk-based criteria for water and sediment". The SSRBCC for aquatic life that were derived in the Risk-Based Closure Criteria Report appear to relate to these closure objectives (i.e., SW2, M1, M2, W3, NI2, NI3, and NI5).	Recommend that the Risk-Based Closure Criteria Report include: - information to link the SSRBCC to specific closure objectives, - a reference to a current summary table of project closure objectives and closure criteria, - descriptions of SSRBCC monitoring / compliance point(s), and - descriptions of relevant discharge points.	Much of the information requested by ECCC is a requirement of the Interim Closure and Reclamation Plan - specifically Appendix V (Closure Objectives and Criteria) and Appendix VI (Post Closure Monitoring). These appendices will be updated in ICRP V4 and will include, where relevant, the proposed SSRBCC. At this time it is unclear if DDMI is to determine "compliance point(s)" in the ICRP as this appears to be Water License matter.		N/A (please see the Interim Closure and Reclamation Plan)	This comment does not influence Diavik's response to EMAB's comments on the SSRBCC but would increase transparency of the closure plan.
ECCC-3	Environment and Climate Change Canada: Bradley Summerfield	Exposure assessment objectives Phase 1 Report Section 1.3 Objectives	The objectives of the SSRBCC state that "Exposure and Risk Characterization components have not been included at the request of DMMI because the objective of the proposed work is to determine safe concentrations (i.e., TRVs) rather than calculate the risk due to exposure to environmental concentrations during closure" (p.1-2). While it is understood that the Toxicity Reference Values which have been adapted as site-specific closure objectives are not meant to contribute to a fulsome risk characterization, they may prove useful as benchmarks for effects assessment during future ERA if a true exposure assessment can be conducted based on real concentrations in media and tissues at the time of closure. In instances where the adopted TRVs have been modified in the Phase 1 Report, for instance by incorporating aspects of exposure (i.e., applying % time on site to TRV), this should be noted to avoid duplication during the exposure assessment and subsequent risk characterization. At the time of closure, true exposure to receptors may be higher than predicted and should at that time be considered additive to existing background concentrations unless true on-site exposure is verified to be equal or less to background; in other words, the total exposure should equal background exposure to receptors from off-site naturally occurring metals plus incremental exposure from on-site sources. Please note that Environment Canada currently has draft guidance concerning the development of Ecological Risk Assessments in scenarios where natural background concentrations occur (available upon request).	In instances where the adopted TRVs have been modified in the Phase 1 Report, this should be noted to avoid duplication during the exposure assessment and subsequent risk characterization. At closure, background exposure should be assessed to quantify true exposure to receptors.	Acknowledged; future exposure assessment and risk characterization will ensure any modified TRVs are accounted for. At closure, background exposure to contaminants will be assessed to quantify the full exposure to receptors. Exposure time on-site was only considered during the COPC screening process. The SSRBCCs were developed with the assumption that ecological ROCs spend all of their time on the Project site (ET = 1).		Phase II Report: Section 1.3.1 (p.1-5).	The approach for identification of COPCs by assuming time on site and not accounting for background may result in not identifying COPCs of concern. However, in previous responses, Diavik has indicated that if a parameter is not identified as a COPC based on their assumptions, that the CCME Environmental Quality Benchmarks (CCME EQGs) would be applied as Closure Criteria. If this approach is taken, then the impacts of this approach should be negligible, except in situations where receptors considered for the closure objective are not protected by the CCME EQGs. Diavik should add to the closure plan that all parameters not identified as COPCs for the Site Specific Risk Based Closure Criteria will have CCME EQGs as default Closure Criteria and provide a rationale of how receptors/exposure pathways not protected by the CCME EQGs (i.e., consumption of aquatic plants and animals) will be addressed in the absence of a SSRBCC.
ECCC-4	Environment and Climate Change Canada: Bradley Summerfield	Exposure assessment - Soil Data Phase 1 Report Section 2.4.3.1	Conservative approaches have been appropriately adapted in the report while screening contaminants of potential concern (COPCs) assuming that the far field stations (presumably representative of background concentrations) were not impacted by the current mining operations. For the purposes of creating risk-based closure criteria, application of the 75th percentile of soil data is considered conservative and protective (as a de facto effects assessment and safe benchmark), however please note that in any future exposure assessment, the 95th percentile of data should be used to represent actual exposure, presuming that there are more than 10 samples.	Future exposure assessment should use the 95th percentile of data to represent actual exposure (assuming n>10).	Acknowldeged; future exposure assessment will use the 95th percentile of environmental data to represent exposure.		N/A	The use of the 75% percentile to identify COPCs is not standard practice and could result in missing some of the COPCs that are associated with localized impacts. In addition, information regarding the distribution of the data set and the number of samples is not provided so that approach may or may not be supported. However, Diavik as indicated that for all parameters that do not screen in as COPCs, the CCME EQGs would be applied. It is recommended that Diavik adds this assumption to all relevant sections of COPC screening.
ECCC-5	Environment and Climate Change Canada: Bradley Summerfield	Allometric scaling Phase 2 report Section 1.3.1, Appendix G 1.4	The report states that "food and water ingestion rates for the wildlife ROCs are based on allometric equations for mammals and birds provided by the Oak Ridge National Laboratory (ORNL 1997)" and that, for aquatic receptors, the application of uncertainty factors was applied (S.4.2). The report acknowledges the inherent limitations of both allometric scaling and uncertainty factors, as well as Environment Canada's stated position on these practices (by reference to the FCSAP Ecological Risk Assessment Guidance –Module 2: Selection or Development of Site-specific Toxicity Reference Values (Environment Canada, 2010)), and in response, this study has adopted the "lowest available toxicity endpoints for available species" in mammals (Appendix G, S. 1.3). Please note Environment Canada's recommendation that allometric scaling should not be applied to birds (Environment Canada, 2010[1]), and that the appliion of uncertainty factors should be limited to instances when extrapolation is between species, but not classes of organisms (Allard et el., 2010[2]). It is unclear from the report whether allometric scaling features in the TRVs that were selected for bird species (Appendix G, S. 1.4).	Clarify whether allometric scaling was used in respect of the TRVs selected for bird species.	As described in Section 1.3 of the Phase II report, there are no TRVs available for the mammalian and avian wildlife species present at Diavik, thus, TRVs from toxicity tests on laboratory/common species were considered instead. Environment Canada (2010, 2012) discourages allometric scaling (i.e., scaling of organism characteristics such as ingestion rate based on influence of organism body size) as well as use of safety/uncertainty factors without support of scientific evidence. Therefore, the lowest available toxicity endpoints for available species that were representative of the wildlife ROCs (including birds) were adopted as appropriate TRVs and allometric scaling was not used to develop TRVs for wildlife species. As described in Section 1.3.1 of the Phase II report, only food and water ingestion rates for the wildlife ROCs were based on allometric equations for mammals and birds, which were obtained from the Oak Ridge National Laboratory (ORNL 1997). Environment Canada (2012) Ecological Risk Assessment Guidance states that allometric scaling can be used for organisms for which data on water and food ingestion rates are not available.	ORNL. 1997. Methods and Tools for Estimation of the Exposure of Terrestrial Wildlife to Contaminants. Publication No. 4650. Prepared for the United States Department of Energy, Office of Environmental Policy and Assistance, Air, Water, and Radiation Division by Oak Ridge National Laboratory: Oak Ridge, TN. Environment Canada. 2010. Federal Contaminated Sites Action Plan (FCSAP) Ecological Risk Assessment Guidance - Module 2: Selection or Development of Site-specific Toxicity Reference Values. Government of Canada, Environment Canada: Gatineau, QC. Environment Canada. 2012. Federal Contaminated Sites Action Plan (FCSAP) Ecological Risk Assessment Guidance. Government of Canada, Environment Canada: Gatineau, QC.	Phase II Report: Sections 1.3.1 (p. 1-5) and 4.3 (p. 4-2 to 4-3).	Does not affect comments made by Arcadis.
ECCC-6	Environment and Climate Change Canada: Bradley Summerfield	Phase 2 Report, Section 3.2 Comparison of proposed SSRBCC, CCME GLs, and Diviak WQ benchmarks	Section 3.2 statest that: "The COPCs identified in water for ecological ROCs were: aluminum, arsenic, cadmium, chromium, cobalt, copper, fluoride, iron, lead, manganese, mercury, molybdenum, nickel, nitrate, nitrite, potassium, selenium, silver, sulphate, uranium, and zinc. The lowest SSRBCCwater for each of these COPCs is presented in Table 3.2-1." Appendix A presents SSRBCC calculations, and states that "The primary exposure route to water for aquatic and terrestrial primary producers, aquatic invertebrates, and fish is via direct contact. Thus the SSRBCC for water for these organisms is equivalent to the TRV (CCME 2007)". Table 3.2-1 of the SSRBCC Phase II Report allows comparison between the proposed SSRBCC, CCME guidelines, and the Diviak WQ benchmarks. The proposed SSBRCC exceed almost all CCME guidelines and/or Diavik WQ benchmarks. Although the SSRBCCwater were developed for all water exposures (not only aquatic life) it is not intuitively clear why the lowest of the guidelines would not be used for the SSRBCCwater. SSRBCC appear to be applied across the board by media type, rather than by receptor.	Clarify selection of SSRBCCwater that are above the lowest TRVs or guidelines.	Water quality guidelines are developed using species which may not be present at the Project site; thus the $SSRBCC_{water}$ have the potential to be elevated above the lowest guidelines as they take into account site-specific species and parameters (e.g., hardness, pH). If the species present on site are not as sensitive as the species considered in the development of water quality guidelines, then there is potential for the $SSRBCC_{water}$ to be higher than water quality guidelines. $SSRBCC_{water}$ were calculated for all applicable ROCs and are presented in Table 2.1 (aquatic life receptors) and Appendices H (mammalian receptors), I (avian receptors), and J (human receptors) of the Phase II report. The $SSRBCC_{water}$ for all ROCs were compared and the lowest was presented in Table 3.2-1 of the Phase II report. In other words, the $SSRBCC_{water}$ from the most sensitive ROC was adopted as the final $SSRBCC_{water}$ for the Project. This provides a conservative water quality goal for the Project as the SSRBCCwater is based on the most sensitive ROC.		Phase II Report: Section 5 (p. 5-1). Additional explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 5).	This approach is generally not acceptable without considerable rationalization and support. Laboratory testing species are chosen for different reasons including ability for standardized cultures and standardized testing methods. The results of the toxicity testing are applied across species. The absence of a standardized test species within a water body does not indicate that other similar species with similar life cycles and histories are not present. The standardized test species are surrogates for other receptors as toxicity testing cannot be completed on each species present in the natural environment. On occassion, the exclusion of cold water species in a warm water system can be supported with rationale. The SSRBCC selected should be based on the protection of the most senstive species or guilds that could be present. This will influence in the selection of SSRBCC and has significant implications in the SSRBCC proposed by Diavik. Diavik has noted in Appendix V of the CRPV4.0 that the SSRBCC derived in the Phase I and Phase II reports for the protection of aquatic life will NOT be used as Closure Criteria. As a result, only big picture comments are provided herein, in the event Diavik returns to this approach for setting the Closure Criteria.
ECCC-7	Environment and Climate Change Canada: Bradley Summerfield	Phase 2 Report, Tables 3.2-1, 3.3-1 and 3.4-1. Natural background conditions	None	Recommend that Table 3.2-1 (SSRBCC for Water), Table 3.3-1 (SSRBCC for Sediment), and Table 3.4-1 (SSRBCC for Fish Tissue) include the the natural background concentration for each COPC (contaminant of potential concern) listed.	Acknowldeged; the tables in the Phase II Report will be updated.		Phase II Report: Tables 3.2-1 (p. 3-3), 3.3-1 (p. 3-4), and 3.4-1 (p. 3-7).	This comment does not influence Diavik's response to EMAB's comments on the SSRBCC.
ECCC-8	Environment and Climate Change Canada: Bradley Summerfield	Appendix G. SSRBCC rationale information	Section 5.2.2 (Closure Objectives and Criteria) of the Interim Closure and Reclamation Plan (version 3.2) states: "In general, DDMI has tried to use available standards or guidelines as initial closure criteria; for example CCME Water Quality Guidelines (CCME 1999)... DDMI intends to use these standards or guidelines as initial criteria unless it has been identified that there are specific site conditions (for example the presence of more sensitive species than used as a basis for the guideline) that might justify different criteria. In addition, if it is determined at some point that these initial criteria are not achievable or are not appropriate (for example if an exposure pathway is not applicable) then DDMI may conduct a site-specific risk assessment to derive a site-specific risk-based closure criterion... Closure criteria that may require the development of risk-based criteria are noted in Appendix V." Appendix G (Toxicity Reference Values) discusses the TRV selection process for contaminants of potential concern (COPCs). Each subsection should include the rationale for requiring a particular TRV / SSRBCC.	The main body of the Risk Based Closure Criteria Report should provide a summary of the rationale for developing each TRV / SSRBCC, and provide a reference to Appendix G. Appendix G should also include the rationale information as a tabular summary.	As stated in Section 1.3 of the Phase I Report, the derivation of SSRBCCs was conducted in two phases. The first phase consisted of the Problem Formulation which identified: representative human and ecological receptors, contaminants of potential concern (COPCs) that required SSRBCCs, and uncertainties associated with the development of SSRBCCs. The second phase consisted of the derivation of the SSRBCCs. The summary for the rationale for developing each TRV/SSRBCC is provided in the Phase I Report in Sections 2.1.1 (Potential Ecological Receptors), 2.1.2 (Potential Human Receptors of Concern), Section 2.2.1 (Potential Exposure Pathways for Ecological Health), Section 2.2.2 (Potential Exposure Pathways for Human Health), Section 2.3 (Potential Sources of Contaminants), and Section 2.4 (Selection of Contaminants of Potential Concern). This information was not repeated in the Phase II report to avoid redundancy and instead Sections of the Phase I Report were referenced in the Phase II Report to guide the reader.		Phase I Report: Sections 2.1.1 (p. 2-1 to 2-5), 2.1.2 (p. 2-5 to 2-6), 2.2.1 (p. 2-7 to 2-8), 2.2.2 (p. 2-8 to 2-11), and 2.3 (p. 2-11 to 2-13).	This comment does not influence Diavik's response to EMAB's comments on the SSRBCC.

ID	Reviewer	Topic	Comment	Recommendation	Proponent Response	References/Link to memo	Location in reports	
ECCC-9	Environment and Climate Change Canada: Bradley Summerfield	Appendix G. SSRBCC derivation methodology	The Canadian Council of Ministers of the Environment have developed guidance documents for the development of guidelines for water and sediments. See "Protocol for the Derivation of Water Quality Guidelines for the Protection of Aquatic Life" (2007) and "Protocol for the Derivation of Canadian Sediment Quality Gudelines for the Protection of Aquatic Life" (1995).	Recommend that the following information is provided for each SSRBCC (water): -identify the guideline type (Type A, B1 or B2) used to derive the SSRBCC/TRV - compare the data used to derive each SSRBCC against the corresponding minimum data set requirements provided in Table 1 of "A Protocol for the Derivation of Water Quality Guidelines for the Protection of Aquatic Life" (CCME 2007) - identify any SSRBCC which do not meet these minimum data set requirements. Recommend that the following information is provided for each SSRBCC (sediment): - identify the guideline approach used to derive the SSRBCC/TRV - compare the data used to derive each SSRBCC against the corresponding minimum data set requirements provided in "Protocol for the Derivation of Canadian Sediment Quality Gudelines for the Protection of Aquatic Life" (CCME 1995) - identify any SSRBCC which do not meet these minimum data set requirements.	Acknowledged; the Phase II Report will be updated.		Phase II Report: Section 2 (p. 2-1 to 2-7). Phase II Report, Appendix G (p. 1 to 22). Phase II Report Appendix H (Aquatic Life Toxicity Studies; 20 pp.). Detailed explanation in memo to Ms. Violet Camsell-Blondin of June 2016 (p. 20-24).	This comment does not influence Diavik's response to EMAB's comments on the SSRBCC. The additional information provided was not reviewed as Diavik has indicated that the SSRBCC for aquatic life derived in the Phase I and Phase II reports will not be used as Closure Criteria.
ECCC-10	Environment and Climate Change Canada: Bradley Summerfield	Appendix G. SSRBCC for aluminum	Appendix G of the SSRBCC Phase II report provides information regarding the TRVs. Table G-1 lists the toxicity reference values (TRVs) for aquatic life receptors. According to footnotes for aluminum and zinc, TRVs based on LCx were not adopted as the aquatic life TRV as ECx values are preferred. Section 1.1.1 of Appendix G describes the TRV selection process for aluminum, and states "The BC MOE (1988) provides results of a toxicity study done on Daphnia and Cyclops species that determined a 72-hour threshold for aluminum of 0.100 mg/L that resulted in 25-30% mortality of the organisms at a pH of 6 to 7.2. Since this was an acute mortality study it was not considered in the selection of an alumimun TRV for aquatic life... The United Stated Environmental Protection Agency (US EPA) Ecotox database ('Ecotox') provided the most conservative LOEC and NOEC within the indicated pH range for Brook Trout eyed embryo and eyed egg life stages... Brook Trout eyed embryos and eyed eggs were exposed for 30 and 60 days to total aluminum concentrations with pH ranging from 6.5 to 6.6 with the reported LOECs for growth and length ranging from 0.088 mg/L to 0.350 mg/L (Cleveland et al. 1989). A TRV of 0.175 mg,/L was selected for aluminum in water for aquatic aquatic life based on a geometric mean from LOECs of 0.088 mg/L. and 0.350 mg/L."	Recommend that the SSRBCC for aluminum be re-evaluated. Based on information in Section 1.1.1 of Appendix G, the toxicity data used to calculate the TRV (and, hence, the SSRBCC) does not appear to be based on the most sensitive species. As Daphnia and Cyclops species appear to be more sensitive than Brook Trout, the proposed SSRBCC would not likely be protective of Daphnia and Cyclops species.	Toxicity studies with non-lethal endpoints conducted with pH levels similar to Lac de Gras (mean and 95th percenile pH during the open water season are 6.85 and 7.08, respectively; mean and 95th percentile pH during the ice covered season are 6.83 and 7.07, respectively) could not be found in the published literature for Daphnia (pH often not reported or less than 6 and greater than 8) and Cyclops (pH often not reported or less than 6 and greater than 8) . However, toxicity studies with non-lethal endpoints conducted under appropriate pH conditions (i.e., 6.5 to 6.6) were available for Brook Trout. Effects on growth were noted in Brook Trout at an aluminum concentration that ranged from 0.088 to 0.35 mg/L, thus Brook Trout are more sensitive to aluminum than Daphnia and Cyclops since they experienced mortality at a higher aluminum concentration (0.1 mg/L) than at which Brook Trout experienced growth effects. Therefore, the geomean of TRVs for Brook Trout was adopted as the SSRBCC for aluminum as it is based on a more conservative endpoint.		Detailed explanation in memo to Ms. Violet Camsell-Blondin of June 2016 (p. 6)	Arcadis did not review the information provided in Appendix H as it was outside the scope of our work and Diavik has indicated in Appendix V of the CRPV4.0 that the SSRBCC derived in the Phase I and Phase II Report protective of aquatic life will not be relied on. However, in general, this approach outlined in the Phase II report is not acceptable and would not be protective of the most sensitive species in the aquatic environment. This relates back to ECCC-6 comment. All SSRBCC based on the approach used by selecting toxicity information for species present in Lac De Gras may not be protective of sensitive species within Lac de Gras and should not be relied upon without extensive rationale that more sensitive species are not or could not be present and utilization of surrogate toxicity data protective of those species.
ECCC-11	Environment and Climate Change Canada: Bradley Summerfield	SSRBCC for lead	None	Recommend that the SSRBCC for lead is re-evaluated. The Rainbox Trout study used for the basis of the SSRBCC for lead might not reflect the toxicity that would occur in the softer waters of Lac de Gras.	The toxicity study on Rainbow Trout that was used to develop the SSRBCC for lead was conducted at a hardness of 28 mg/L (Goettl, Sinley, and Davies 1973). Mebane, Hennessy, and Dillon (2008) conducted toxicity studies on Rainbow Trout at water hardness levels that ranged from 17 to 21 mg/L, which is closer to the water hardness in Lac de Gras. However, the thresholds for lead ranged from 0.026 to 0.098 mg/L (Mebane, Hennessy, and Dillon 2008), which is much higher than the range of 0.004 to 0.008 mg/L found by Goettl, Sinley, and Davies (1973). Therefore, adopting the lower lead threshold (despite the higher water hardness) is more conservative and likely over-predicts the risk to Rainbow Trout in Lac de Gras.	Goettl, J. P. J., J. R. Sinley, and P. H. Davies. 1973. *Water Pollution Studies* . Job Progress Report, Federal Aid Project F-33-R-8, DNR: Denver, CO. Mebane, C. A., D. P. Hennessy, and F. S. Dillon. 2008. Developing acute-to-chronic toxicity ratios for lead, cadmium, and zinc using rainbow trout, a mayfly, and a midge. Water, Air, and Soil Pollution, 188 (1-4): 41-66.	Phase II Report: Table 3.2-1 (p. 3-3), and Appendix G Section 1.1 (p. 1 of 22). Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 6).	Arcadis did not review the information provided in Appendix H (the aquatic toxicity studies relied upon) as it was outside the scope of work and Diavik indicated that the SSRBCC for aquatic life derived in the Phase I/Phase II reports will not be used as closure criteria; however please consider response to ECCC-6 for appropriateness of approach taken in the event Diavik reverts back to this methodology.
ECCC-12	Environment and Climate Change Canada: Bradley Summerfield	SSRBCC for zinc	Section 1.1.19 of Appendix G describes the TRV selection process for zinc. The TRV (and, hence, the SSRBCC) for zinc in water was selected based on a Rainbow Trout toxicity study. According to the BC MOE Ambient Water Quality Guidelines for Zinc (1999), zinc is most toxic to microscopic organisms in the aquatic environments. The BC MOE freshwater aquatic life guideline for zinc (at water hardness less than or equal to 90 mg/L CaCO3) is 33 ug/L total zinc (maximum concentration) and 7.5 ug/L total zinc (30 day average concentration).	Recommend that the SSRBCC for zinc in water be re-evaluated. The proposed SSRBCC exceeds the BC MOE guidelines, and is not based on the most sensitive organism.	Zinc toxicity is hardness-dependent. An Ecotox database search found a 7-day LC_{50} for zinc for *Hyalella azteca* of 0.056 mg/L with a water hardness of 18 mg/L $CaCO_3$ (Borgman et al. 2005). An uncertainty factor (UF) of 10 is required for conversion from lethal to sublethal effects, which would provide a TRV of 0.0056 mg/L. A literature search for toxicity studies with soft water found a 69-day LC_{10} for mortality for Rainbow Trout of 0.088 mg/L (Mebane, Hennessy, and Dillon 2008). The LC_{10} for mortality was more sensitive than the EC_{10} growth endpoints reported thus a UF was not applied. The TRV for *H. azteca* is lower than that for Rainbow Trout, thus the TRV for *H. azteca* should be adopted as the zinc SSRBCC for water. However, as stated in Section 3 of the Phase II Report, when SSRBCCs are lower than the CCME guideline, the guideline is adopted as the SSRBCC. Therefore, the zinc SSRBCC for water is equivalent to the CCME guideline for the protection of aquatic life of 0.03 mg/L (CCME 2015).	Borgmann, U., Y. Couillard, P. Doyle, and D. G. Dixon. 2005. Toxicity of sixty-three metals and metalloids to Hyalella azteca at two levels of water hardness. Environmental Toxicology and Chemistry, 24 (3): 641-52. CCME. 2015. Canadian Environmental Quality Guidelines - Summary Table. Canadian Council of Ministers of the Environment. http://st-ts.ccme.ca/en/index.html (accessed August 2015). Mebane, C. A., D. P. Hennessy, and F. S. Dillon. 2008. Developing acute-to-chronic toxicity ratios for lead, cadmium, and zinc using rainbow trout, a mayfly, and a midge. Water, Air, and Soil Pollution, 188 (1-4): 41-66.	Phase II Report: Table 3.2-1 (p. 3-3), and Appendix G Section 1.1 (p. 1 of 22). Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 6).	Arcadis did not review the information provided in Appendix H (the aquatic toxicity studies relied upon) as it was outside the scope of work and Diavik indicated that the SSRBCC for aquatic life derived in the Phase I/Phase II reports will not be used as Closure Criteria; however please consider response to ECCC-6 for appropriateness of approach taken in the event Diavik reverts back to this methodology.
EMAB-2	Environmental Monitoring Advisory Board: From EMAB	Possible Workshop on SSRBCC on June 10	EMAB will attend the workshop if it goes ahead. If the WLWB adopts EMAB's recommendations regarding the SSRBCC report EMAB does not see a need for a workshop.	None	Acknowledged, no response required.		N/A	N/A
EMAB-3	Environmental Monitoring Advisory Board: From EMAB	Section 1.2, p.1-1; Statement that "…SSRBCC become the TRV that would be used as the maximum acceptable concentration…" is incorrect.	A TRV is defined as a daily dose of a chemical expressed in milligrams of chemical per kilogram of body weight per day that would not result in an adverse effect over a lifetime of exposure. The use of "TRV" when describing a SSRBCC is incorrect.	Rephrase this sentence to remove the word TRV and to indicate that the SSRBCC becomes a concentration on Site that would not result in unacceptable adverse effects based on the assumptions used in this process (This comment is a transparency issue and would not likely affect the outcome of setting the SSRBCC).	Acknowledged; the Phase I Report will be updated to say: Once adopted, SSRBCC become the COPC concentration on site that is unlikely to cause adverse effects in ecological or human receptors in any future risk assessment based on the assumptions used in this process.		Phase I Report: Section 1.2 (p. 1-1).	Comment addressed.
EMAB-4	Environmental Monitoring Advisory Board: From EMAB	Section 1.2 , p.1-1, second paragraph	It is unclear what "potential sources of contaminants in the receiving environment" refers to.	Clarification should be provided in the report.	Acknowledged; the Phase I Report will be updated to say: The Problem Formulation consists of identifying potential receptors, sources of contaminants in the receiving environmentfrom the Project site, exposure pathways, and projectsite-specific COPCs.		Phase I Report: Section 1.2 (p. 1-1).	Comment addressed.
EMAB-5	Environmental Monitoring Advisory Board: From EMAB	Section 1.2 , p.1-1, Statement that "The standard ecological risk assessment framework used in Canada….	This statement should include human health risk assessment	Human health risk assessment should be added to the sentence.	Acknowledged; the Phase I Report will be updated to say: "The standard human and ecological risk assessment framework used in Canada…"		Phase I Report: Section 1.2 (p. 1-1).	Comment addressed.
EMAB-6	Environmental Monitoring Advisory Board: From EMAB	Section 1.2 , p.1-1, second last paragraph	The use of project in "project-specific COPCs" and "SSRBCC that are relevant for the Project" in this paragraph is misleading as it indicates that COPCs are not site specific, but project specific. No details are given as to what is considered the project and the relationship to the Site as such.	Justification is required why COPCs would not be considered for the Site, but the Project. This should include details on the Project.	Acknowledged; the Phase I Report will be updated.		Phase I Report: Section 1.2 (p. 1-1).	Comment addressed.
EMAB-7	Environmental Monitoring Advisory Board: From EMAB	Section 1.3, p1-2: Use of the term TRV and "safe"	The use of the term TRV to represent a "safe" concentration from Site exposure is incorrect.	The report should remove the reference to a TRV as a safe benchmark, because it is not technically correct. It is also recommended that the word "safe" is not used but instead "acceptable risk" or "negligible risk" as defined by the appropriate guidance being followed (This comment is a transparency issue and would not likely affect the outcome of setting the SSRBCC).	Acknowledged; the Phase I Report will be updated.		Phase I Report: Section 1.2 (p. 1-1).	Comment addressed.
EMAB-8	Environmental Monitoring Advisory Board: From EMAB	Section 2.1.1, Table 2.1-1: Term Zooplankton and Benthic exposure	Zooplankton is a surrogate receptor representing pelagic invertebrates; benthic invertebrates exposure to sediment not indicated	Replace zooplankton with pelagic invertebrates and add water and sediment exposure to benthic invertebrates (This comment is a transparency issue and would not likely affect the outcome of setting the SSRBCC).	Acknowledged; the Phase I Report will be updated.		Phase I Report: Section 2.1 (p. 2-1 to 2-7), and Table 2.1-1 (p. 2-2 to 2-5).	Comment addressed.
EMAB-9	Environmental Monitoring Advisory Board: From EMAB	Section 2.1.1, Table 2.1-1: Selection of Mammal ROCs	Not all guilds are represented by the receptor selection for small mammals	Add a representative ROC for herbivore and insectivore small mammals (This comment could influence the outcome of setting the SSRBCC).	Refer to the response in the attached document. Snowshoe hare was added as a representative small mammal herbivore ROC and the common shrew was added as a representative small mammal insectivore ROC. However, the results of the assessment (i.e., final SSRBCCs for the Project) remain unchanged. Results will be incorporated into the next phase of the report.	**See attachment**	Phase I Report: Section 2.1 (p. 2-1 to 2-7), and Table 2.1-1 (p. 2-2 to 2-5).	Comment addressed.
EMAB-10	Environmental Monitoring Advisory Board: From EMAB	Section 2.1..1, Table 2.1-1: Selection of Mammals ROCs	The grizzly bear is not an aquatic omnivore. Aquatic mammals have not been represented in the receptor identification.	Please add surrogate aquatic mammal receptors if appropriate. If none are relevant for the Site, please provide a rationale why this group of organisms do not need to be considered in the ERA.	There is an "and/or" missing in the Receptor Type column for grizzly bear in Table 2.1-1 as it was not meant to indicate that grizzly bear are aquatic omnivores, rather it was to indicate they fall into the category of aquatic and/or terrestrial omnivores. Aquatic mammals such as river otter and mink have not been recorded on-site or at the nearby the Ekati project. Therefore, potential exposure to COPCs was not considered for these aquatic mammals.		Phase I Report: Section 2.1.1 (p. 2-2), and Table 2.1-1 (p. 2-2 to 2-5).	Just because an organism has not been observed, does not mean that they are not or could not be present. Further discussion of lack of habitat for aquatic mammals should be provided in the report to exclude the consideration of these receptors.
EMAB-11	Environmental Monitoring Advisory Board: From EMAB	Table 2.1-1 Red Fox Carnivore	Red Fox is an omnivore.	Make changes in Table.	Acknowledged; the table in the Phase I Report will be updated.		Phase I Report: Section 2.1 (p. 2-1 to 2-7), and Table 2.1-1 (p. 2-2 to 2-5).	Comment addressed.
EMAB-12	Environmental Monitoring Advisory Board: From EMAB	Table 2.1-1 Aquatic/terrestrial omnivore -Bald Eagle	Although Bald Eagle feed on fish, it is not considered an aquatic omnivore.	Make changes in Table.	Acknowledged; the table in the Phase I Report will be updated.		Phase I Report: Section 2.1, Table 2.1-1 (p. 2-2 to 2-5).	Comment addressed.

ID	Reviewer	Topic	Comment	Recommendation	Proponent Response	References/Link to memo	Location in reports	
EMAB-13	Environmental Monitoring Advisory Board: From EMAB	Section 2.1.2.2, p. 2-5: Human receptor choices	There may be situations where an Aboriginal elder may be more susceptible than a toddler based on traditional lifestyle. It is also not clear if non-Aboriginal people are being included in the assessment as exposures will be different for a worker on the Site or a recreational user.	Additional information regarding the choice and consideration of human receptors should be added. Averaging carcinogens over a lifetime is appropriate for the HHRA (This comment could influence the outcome of setting the SSRBCC).	As described in Section 2.1.2 of the Phase I Report, Aboriginal groups were included as the most sensitive human receptors of concern as the Project is located within the traditional lands of Inuit, Dene, and Métis people. It is expected that they would have the highest exposure to COPCs from the various exposure routes considered due to the amount of time they could potentially spend on the land (i.e., three months of the year as described in Section 1.3.2 of the Phase II Report). During the Closure and Post-closure phases of the Project it is not expected that workers would spend significant periods of time on-site, and they would not be harvesting country foods; therefore, workers would experience fewer exposure pathways than Aboriginal receptors. Furthermore, the health of on-duty workers is addressed by various legislation and health and safety codes. Thus the assessment of Aboriginal receptors ensures that the receptors with the highest potential for exposure are considered, which would result in the most conservative SSRBCCs. It is acknowledged that Aboriginal elders may consume country foods more often than other age groups; however, maximum consumption rates of country foods from a published study on the traditional food intake in indigenous communities in Denendeh and the Yukon (Batal et al. 2005) were considered. It was assumed that a toddler would eat country foods at a rate 50% less than adults (Section 1.3.2 of the Phase II Report). As described in Section 2.1.2.2 of the Phase I Report, toddlers are the most susceptible to chemicals due to their ratio of body size to ingestion rates compared to other life stages, especially when it is assumed that they eat 50% of the maximum amount an adult would. An HHRA was not conducted in the derivation of SSRBCCs; however, if an HHRA is conducted in the future, averaging carcinogens over a lifetime is appropriate.	Batal, M., K. Gray-Donald, H. V. Kuhnlein, and O. Receveur. 2005. Estimation of traditional food intake in indigenous communities in Denendeh and the Yukon. *International Journal of Circumpolar Health* , 64 (1): 46-54.	Phase I Report: Section 2.1.2 (p. 2-5 to 2-7).	Comment addressed.
EMAB-14	Environmental Monitoring Advisory Board: From EMAB	Section 2.2.1 Potential Exposure Pathways for Ecological Health	The list of potential exposure pathways appears to be incomplete and the following, potentially complete pathways are missing : Terrestrial Animals- Dermal Contact, Inhalation, Soil Inhalation; Dermal Contact Sediment for terrestrial animals that obtain food/prey from surface water bodies, Aquatic Animals- Dermal Contact; Vegetation- root uptake of soil COPCs, root uptake of groundwater, root uptake of surface water, direct contact of roots with COPCs; Aquatic vegetation- root uptake from sediment and surface water.	These pathways should be included in the initial listing of potentially complete pathways. Although some of these pathways may be considered minimal later and may only be evaluated qualitatively, they should be included for completeness.	As described in Section 2.2.1 of the Phase I Report, terrestrial wildlife exposure to contaminants via the inhalation and dermal contact pathways were not considered in the assessment. Wildlife TRVs for inhalation and dermal contact are unavailable, and inhalation and dermal exposures are expected to be very small contributors to overall dose compared to the ingestion pathway (Sample et al. 1997; BC MOE 2015). Thus, wildlife exposure to contaminants via inhalation and dermal contact are not pathways usually considered (Environment Canada 2012). As described in Section 2.1.1 of the Phase I Report, terrestrial plants are directly exposed to soil, and uptake from soil is expected to be the greatest contributor to COPC exposures for plants. Terrestrial plants may be incidentally exposed to water during periods of precipitation or snowmelt, however, water contact was excluded as a significant exposure route for terrestrial plants as they are not expected to be growing within lakes and seeps (unlike aquatic plants). Groundwater was not considered as a source of COPCs and is often considered an insignificant exposure media for terrestrial plants especially given that vegetation in the arctic tends to be shallow rooting, and any surficial groundwater or seepage is expected to only be flowing in the arctic climate for a few months of the year. SSRBCCs were not developed for terrestrial plant exposure to groundwater. The SSRBCCs developed for terrestrial plants due to soil exposure are presented in Table 2-2 of the Phase II Report. As described in Section 2.1.1 of the Phase I Report, aquatic plants are directly exposed to water, and water is considered the most significant pathway for COPC exposures for aquatic plants. SSRBCCs were developed for aquatic plants due to water exposure (Table 2-1 of the Phase II Report). The aquatic plants identified at the Project are listed in Appendix B of the Phase II Report and all species listed are phytoplankton, and do not root in sediment. COPCs associated with sediment are often bound to the particulate matter, limiting bioavailability and direct uptake from sediment to aquatic vegetation (Environment Canada 2012). Therefore, the sediment exposure route for aquatic plants was deemed an insignificant pathway and not considered in the derivation of SSRBCCs. Furthermore, toxicity studies relied on in the SSRBC development are primarily conducted on algae and phytoplankton species (identified aquatic vegetation onsite) as opposed to rooted aquatic plants. The derivation of SSRBCC's differs from the development of a human health or ecological risk assessment that sums the risk from all exposure routes. SSRBC derivation focused on the identified major routes of exposure to drive the development of SSRBCCs for receptors. Minor routes of exposure have minimal contribution to SSRBCC development, and would not produce the lowest SSRBCCs.	BC MOE. 2015. Tier 1 Ecological Risk Assessment Policy Decision Summary. British Columbia Ministry of Environment. http://www.env.gov.bc.ca/epd/remediation/standards_criteria/standards/tier1policy.htm (accessed September 2015). Environment Canada. 2012. Federal Contaminated Sites Action Plan (FCSAP) Ecological Risk Assessment Guidance. Module 3: Standardization of Wildlife Receptor Characteristics. Gatineau, QC. Sample, B. E., M. S. Aplin, R. A. Efroymson, G. W. Suter II, and C. J. E. Welsh. 1997. Methods and Tools for Estimation of the Exposure of Terrestrial Wildlife to Contaminants. ORNL/TM-13391. Oak Ridge National Laboratory, US Department of Energy: Oak Ridge, TN.	Phase I Report: Section 2.2 (p. 2-7 to 2-11). Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 8).	Comment addressed.
EMAB-15	Environmental Monitoring Advisory Board: From EMAB	Section 2.2.2, p.2-7: Air inhalation	The report indicates that dust levels at closure are expected to be a minimum.	Additional information supporting this assumption should be provided. This should include why wind born dust is not considered relevant after closure, especially since revegetation may not be part of the closure plan. This is a transparency issue and will likely not affect the outcome of the SSRBCC.	DDMI's general observation of dust generation during operations is that mining activities (blasting, trucks on roads, dumping, construction, etc.) are the primary sources of dust rather than wind generated dust from the landscape. Further the finer materials that are more susceptible to dust generation like the fine processed kimberlite are to be covered with a rock cover or water. These will provide protection against wind erosion rather than vegetation. Further it should be noted that closure criteria for dust were proposed for dust in ICRP V4 based on reviewer recommendations. At this time DDMI is not expecting to change this in ICRP V4. The objective and criteria from ICRP V3.2 is as follows: - Objective SW3: Dust levels safe for people, vegetation, aquatic life, and wildlife. - Criteria: Mean TSP concentrations less than 60 ug/m3 annual and 120 ug/m3 24 hr maximum acceptable (Canadian Ambient Air Quality Objectives and NWT Ambient Air Quality Standards) or site-specific risk-based criteria met.		Phase I Report: Section 2.2.2 (p. 2-8 to 2-11).	Comment addressed.
EMAB-16	Environmental Monitoring Advisory Board: From EMAB	Section 2.2.2.1, p.2-7 - p.2-8	The report indicates a number of animals that are identified as country foods. The report does not reference the use of vegetation for medicinal purposes, teas or consumption other than berries.	The report should indicate the surrogate receptors that represent these country foods for human consumption and should ensure that all possible exposure pathways are considered. This is a transparency issue and could affect the outcome of the SSRBCC.	Since it is not possible to assess all potential country foods, one representative species is selected from each of the following groups of foods: wild game, fish, and vegetation. Representative country foods from the different groups are selected because the relative exposure of organisms in each group to environmental media varies with specific habitat and foraging behaviours (e.g., a moose has a different life history and potential for COPC exposure than a fish). A species that represents the highest consumption level and, therefore, results in the highest potential dietary exposure to COPCs, is selected from within each of these groups. If foods that represent the highest rate of exposure are determined to be safe for consumption, then all other foods within the group would also be considered safe for consumption. The country foods that Aboriginal groups in the Project area consume (Section 2.2.2.1 of the Phase I Report) were obtained from the Human Health Risk Assessment (HHRA) conducted for the nearby Jay Project (Golder Associates Ltd. 2015). The HHRA mentioned that Aboriginal groups in the area consume berries and traditional medicinal plants. It was assumed that berries would be consumed at a greater rate than a medicinal plant, which is used for the specific purpose of healing, thus the assessment focused on berries rather than other plants that may occasionally be consumed. Furthermore, medicinal plants are usually not consumed entirely, rather they tend to be boiled as teas and used in poultices, which can affect the amount of COPCs consumed. Since the preparation methods used for medicinal plants were not available, it was assumed that the most conservative assessment would be to consider berries that are consumed as a whole.	Golder Associates Ltd. 2015. *Human and Wildlife Heath Risk Assessment Report for the Jay Project* . Prepared for Dominion Diamond Ekati Corporation by Golder Associates Ltd.: n.p.	Phase I Report: Section 2.2.2.1 (p. 2-11).	Teas and tinctures typically have a higher bioavailability than whole foods. The Phase II report should indicate that consideration for the protection of all country foods was given in the derivation of the SSRBCC.
EMAB-17	Environmental Monitoring Advisory Board: From EMAB	Section 2.2.2.1, p. 2-9	The RA report indicates that the Arctic Hare would likely represent the highest exposure to small mammals harvested as country foods.	It is not clear why the Arctic Hare wasn't represented as an ecological ROC. Please provide a rationale.	Please see response to EMAB-9.		Phase I Report: Section 2.1, Table 2.1-1 (p. 2-2 to 2-5).	Comment addressed.
EMAB-18	Environmental Monitoring Advisory Board: From EMAB	Section 2.2.2.1, p. 2-9	The report indicates that lake trout are among the largest freshwater piscivorous fish; however, Northern pike has also been identified. The report also indicates that lake trout could experience increased metal bioaccumulation in tissue compared with non-piscivorous fish.	Rationale should be provided of why the lake trout would represent the highest body burden of metals to be considered in the HHRA. (This comment could influence the outcome of setting the SSRBCC.)	Both Lake Trout and Northern Pike are piscivorous fish that have been found in Lac de Gras. However, Lake Trout live longer than Northern Pike with a maximum reported age of 50 years for Lake Trout (Power 1978), versus 30 years for Northern Pike (Muus and Dahlström 1968). Fish that live longer have more opportunity to accumulate metals in their tissues, thus Lake Trout have the potential to accumulate higher body burdens of metals than Northern Pike due to their greater longevity.	Muus, B. J. and P. Dahlström. 1968. Süßwasserfische. München, DE: BLV Verlagsgesellschaft. Power, G. 1978. Fish population structure in Arctic lakes. Journal of the Fisheries Research Board of Canada, 35: 53-59.	Phase I Report: Section 2.2.2.1 (p. 2-11).	Comment is partially addressed. Accumulation in fish tissue is a function both of age and size and given that Northern Pike reach greater sizes the statement/assumption may not be correct.
EMAB-19	Environmental Monitoring Advisory Board: From EMAB	Section 2.3.3.1, p. 2-11	The report indicates that the Processed Kimberlite Containment Area (PKCA) and the North Country Rock Pile (NRCP) will be capped with Type 1 Rock. No information regarding the residual contamination under the cap or maintenance of the cap was provided in the Phase I Report. The potential for exposure to the existing contaminants in these areas should be considered and discussed.	The report should specify what contaminants are currently present in these areas and if future exposure to these will be blocked or just reducted. In addition the report should indicate how deep this cap will be and how the thickness will be maintained in the future. This is a transparency issue and will likely not affect the outcome of the SSRBCC.	For the purpose of selecting which COPC to derive SSRBCC the key exposure pathways are through water for both the PKC and NCRP. The PKC cover is currently planned at 1 m thickness (to enable use of run-of-mine rock) and the NCRP will have a 3 m rock cover and 1.5 m thick till cover. For the purpose of selecting COPC for SSRBCC we believe that on this basis it was appropriate to remove direct contact with processed kimberlite and type III rock and focus on seepage water quality. DDMI respects concerns raised regarding maintenance (specific maintenance plans are not currently available), but do not believe that inclusion of direct contact as an exposure pathway for type III rock or processed kimberlite is required at this time for proposing SSRBCC.		Phase I Report: Section 2.3.3.1 (p. 2-13).	Comment is addressed. However, EMAB must ensure that maintenance of the cap is part of the closure plan and is designed to maintain as a blockage of this pathway, otherwise the SSRBCC may not be protective.
EMAB-20	Environmental Monitoring Advisory Board: From EMAB	Section 2.3.4.1, p. 2-11	The report indicates that sediment in the North Inlet was included in the assessment for ecological receptors.	The report should specify why humans in the future would not be exposed to this sediment through wading or recreational activities. This is a transparency issue and will likely not affect the outcome of the SSRBCC.	Wading or recreational activities would likely only expose the feet of an individual to sediment, thus there would be a very small surface area of the body exposed. Furthermore, it is unlikely that an individual would spend long periods of time standing or wading in sediment as Arctic lakes have cold temperatures and the sediment would most likely be washed off with the lake water upon exit. Therefore the exposure time of the feet to sediment would be very short. Since exposure to sediment involves a small dermal surface area and a short period of time, the potential risk to human health is negligible. Furthermore, Health Canada (2010) does not provide guidance on the assessment of dermal contact with sediment; therefore, human exposure to sediment was not considered in the derivation of SSRBCCs.	Health Canada. 2010. *Federal Contaminated Site Risk Assessment in Canada, Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA)* . Version 2.0. Revised 2012. Contaminated Sites Division, Safe Environments Directorate: Ottawa, ON.	Phase I Report: Section 2.2.2 (p. 2-8 to 2-9).	Health Canada does provide guidance on direct contact exposure to sediment, although the reviewer acknowledges that this guidance was released in 2017, it should be considered moving forward. Consideration for low frequency exposure to sediments is provided in the guidance document.
EMAB-21	Environmental Monitoring Advisory Board: From EMAB	Section 2.3.4.3, p. 2-11	The report indicates that an assumption was relied on that a barrier between Lac de Gras and North Inlet will be in place after closure and no fish will transverse this barrier	The report will need to discuss this barrier more. How will fish be prevented from entering the North Inlet, how long does this barrier need to be maintained? What happens if this barrier fails? Is the consultant confident that fish are not currently located in the North Inlet? This comment could influence the outcome of setting the SSRBCC.	The North Inlet is currently separated from Lac de Gras by and east and west dam preventing fish movement from Lac de Gras. The closure plan for the North Inlet has some uncertainty as the North Inlet is actively used as a surge/settling pond ahead of the North Inlet Water Treatment Plant and so will have accumulated materials on the bottom over the life-of-mine. For the SSRBCC we assumed it would not be re-joined with Lac de Gras as risks associated with the North Inlet were actively being considered elsewhere (see Section 4.5 in DDMI 2016). DDMI notes that the closure objective for the North Inlet continues to be to join the North Inlet with Lac de Gras.	Diavik Diamond Mines Inc. (DDMI). 2016. Memorandum to Ms. Violet Camsell-Blondin, Chair of the Wek'eezhii Land and Water Board, dated Februrary 26, 2016. Accessed online June 2016 from: http://www.mvlwb.ca/Boards/WLWB/Registry/2015/W2015L2-0001/Diavik%20-%20North%20Inlet%20Hydrocarbon%20Investigation%20and%20Sludge%20Management%20Reports%20-%20Version%201.1%20-%20Part%201%20-%20Feb%2026_16.pdf	Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 9).	As the reconnectivity of the North Inlet to Lac de Gras has been proposed by DDMI to be removed as an objective, comments pertaining to SSRBCC protective of this area have not been made. However, EMAB does not agree that this closure objective should be removed.

ID	Reviewer	Topic	Comment	Recommendation	Proponent Response	References/Link to memo	Location in reports	
EMAB-22	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.2, p. 2-12	The report indicates that the identification of COPCs used the maximum, 95th percentile or 75th percentile to identify COPCs.	The identification of COPCs should be made using the maximum detected concentration. Statistics may be used if supported by the data to calculate exposure point concentrations in a risk assessment, but not in the identification of COPCs. This comment could influence the outcome of setting the SSRBCC.	The purpose of screening for COPCs using maximum concentrations is to ensure that no parameters are excluded from a risk assessment when they should be considered. However, for the purposes of deriving SSRBCCs, if a parameter was not screened into the assessment during the COPC selection process the closure criteria will be the CCME (2015) environmental quality guidelines. This would result in a conservative benchmark for use as closure criteria in the event that parameters were missed in the COPC selection process through the use of a statistic other than the maximum concentration.	CCME. 2015. Canadian Environmental Quality Guidelines - Summary Table. Canadian Council of Ministers of the Environment. http://st-ts.ccme.ca/en/index.html (accessed August 2015).	Phase I Report: Section 2.4.2 (p. 2-14 to 2-15).	The purpose of developing SSRBCC is so that site-specific criteria can be applied to the closure plan as opposed to relying on generic guidelines that may be overly-protective for the specific site. As a result, the identification of COPCs should be inclusive of all mine related COPCs. However, the approach now proposed by Diavik to default to CCME EQG if a SSRBCC has not been developed is acceptable in most situations and will address the concerns of missing COPCs. Please indicate in the closure plan that any parameter in soil, groundwater, sediment and surface water that was not identified as a COPC and therefore did not have a SSRBCC derived, that the Closure Criteria will default to the CCME EQG for that media. In situations where the CCME EQG would not be protective of all exposure pathways, Diavik should indicate how these receptors will be protected (i.e., aquatic birds and mammals are not protected by the CCME WQG protective of Aquatic Life).
EMAB-23	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.2, p. 2-13	The secondary screening of COPCs looks at the comparision of maximum and mean concentrations of COPCs in environmental media to the maximum and mean baseline concentrations.	There was no detail provided regarding the baseline study or the sample size for each of the environmental media. At a minimum, summary statistics (such as the number of samples, the minimum and maximum concentrations, the 95% UCLM, and the 95th percentile) should be provided. In addition, excluding COPCs from the derivation of SSRBCC based on reference concentrations is not appropriate for the derivation of closure criteria. If a COPC could be associated with historical or future activities at the mine, a SSRBCC should be developed.	First it is important to note the information referenced above was only used to screen the contaminants where site-specific risk-based criteria would be advanced at this time. This information was not used to estimate post-closure exposure concentrations or evaluate associated risks. The information was also not used to select total COPC for closure. To clarify this, we will add the relevant CCME (or equivalent) criteria for parameters that do not have SSRBCC. Regardless, we understand that reviewers would like more information about the data used to determine which parameters would have SSRBCC. These will be provided in a revised document that will be included in support of ICRP V4. The purpose of screening for COPCs using maximum concentrations is to ensure that no parameters are excluded from a risk assessment when they should be considered. However, for the purposes of deriving SSRBCCs, if a parameter was not screened into the assessment during the COPC selection process the closure criteria will be the CCME (2015) environmental quality guidelines. This would result in a conservative benchmark for use as closure criteria in the event that parameters were missed in the COPC selection process through the use of a statistic other than the maximum concentration. Parameters that were not screened into the assessment during the COPC screening process will default to the environmental quality guidelines as closure criteria.	CCME. 2015. Canadian Environmental Quality Guidelines - Summary Table. Canadian Council of Ministers of the Environment. http://st-ts.ccme.ca/en/index.html (accessed August 2015).	Phase I Report: Sections 2.3.2 (p. 2-12), and 3.4 (p. 3-2 to 3-4). Revised document included in support of ICRP V4.	Defaulting to CCME EQG is an acceptable approach and should be indicated in the closure plan as the proposed approach for all parameters where a SSRBCC was not derived.
EMAB-24	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.3, p. 2-13	The statistical summaries of Type I Rock are not suitable to assess risks or to back calculate a risk based concentration	The maximum concentration should be used to identify which parameters require a SSRBCC to be developed.	The purpose of screening for COPCs using maximum concentrations is to ensure that no parameters are excluded from a risk assessment when they should be considered. However, for the purposes of deriving SSRBCCs, if a parameter was not screened into the assessment during the COPC selection process the closure criteria will be the CCME (2015) environmental quality guidelines. This would result in a conservative benchmark for use as closure criteria in the event that parameters were missed in the COPC selection process through the use of a statistic other than the maximum concentration.	CCME. 2015. Canadian Environmental Quality Guidelines - Summary Table. Canadian Council of Ministers of the Environment. http://st-ts.ccme.ca/en/index.html (accessed August 2015).	Phase I Report: Section 2.3.2 (p. 2-12).	Defaulting to CCME EQG is an acceptable approach and should be indicated in the closure plan as the proposed approach for all parameters where a SSRBCC was not derived.
EMAB-25	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.3, p. 2-13	Not enough information is presented to allow the reviewer to determine whether the normal range of metal concentrations in soil is representative of baseline conditions.	Data from the whole facility area should be included in the determination of natural variability for baseline conditions. The number of samples collected and the distribution should be provided as well as a discussion of how the sampling areas are not known to be impacted by any other anthropogenic sources prior to completion of the baseline study.	Please see response to WLWB-7.		Phase I Report: Section 2.4.2 (p. 2-14 to 2-15). Revised document included in support of ICRP V4.	The response to WLWB-7 does not address our comment, nor does it address the concern raised within comment WLWB-7. However, since DDMI has committed to using the CCME EQG for all parameters without SSRBCC derived, then the concern with the approach is no longer an issue.
0	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.3, p. 2-13	No rationale was provided why the US EPA ECO-SSLs were appropriate for identification of COPCs	Provide a rationale for the COPC selection process.	As stated in Section 2.4.2 of the Phase I report, in the first COPC screening step, maximum or 95th percentile concentrations of each parameter in an environmental media were compared to an appropriate environmental quality guideline. As stated in Section 2.4.3 of the Phase I Report, in the absence of CCME soil quality guidelines for the protection of agriculture, US EPA ECO-SSLs for the protection of ecological receptors were used as there are no other Canadian or provincial soil quality guidelines available. The Eco-SSLs were deemed appropriate for COPC screening purposes as they are recently derived risk-based ecological soil screening levels for soil contaminants that are used in the United States to identify COPCs in soil for ecological risk assessments (US EPA 2003). The Eco-SSLs represent concentrations of contaminants in soil that are considered protective of ecological receptors that are often in contact with soil, or that ingest biota that live in or on soil (US EPA 2003).	US EPA. 2003. Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs). OSWER Directive 9285.7-55. United States Environmental Protection Agency: Washington, DC.	Phase I Report: Section 2.4.3.1 (p. 2-15 to 2-16).	The response to comments indicate that there are no other Canadian or provincial soil guidelines available. As British Columbia, Alberta and Ontario have soil guidelines developed, it is not clear the basis for this statement. The use of the EcoSSLs will confer the level of protection required to meet the closure objectives.
EMAB-27	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.3, p. 2-14, Table 2.1-2	The guideline for Nickel in soil is incorrect	Please correct the nickel guideline.	Acknowledged. Table 2.1-2 in the Phase I Report will be updated with the correct nickel soil qualtiy guideline of 45 mg/kg rather than 50 mg/kg. However, as shown in Appendix A-1 of the Phase I Report, the correct nickel guideline of 45 mg/kg was used in the COPC screening process. Therefore, the error in Table 2.1-2 does not change the results of the derivation of SSRBCCs.		Phase I Report: Section 2.4.3.1, Table 2.4-1 (p. 2-16). Note that Table 2.4-1 in the updated Phase I Report replaces Table 2.1-2 in the previous version of the Phase I Report.	Comment addressed.
EMAB-28	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.3., p. 2-14, Table 2.1-2	It is not clear where the sulphur guideline has been derived from.	Please provide a reference for sulphur.	The sulphur soil quality guideline shown in Table 2.1-2 of the Phase I Report was obtained from the CCME Soil Quality Guidelines for the Protection of Environmental and Human Health – Agricultural, which is 500 mg/kg dry weight (CCME 2015).	CCME. 2015. Canadian Environmental Quality Guidelines - Summary Table. Canadian Council of Ministers of the Environment. http://st-ts.ccme.ca/en/index.html (accessed August 2015).	Phase I Report: Section 2.4.3.1, Table 2.4-1 (p. 2-16). Note that Table 2.4-1 in the updated Phase I Report replaces Table 2.1-2 in the previous version of the Phase I Report. Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 9).	Comment addressed.
EMAB-29	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.3, p. 2-14	The rationale for the selection of statistical comparisons of the parameters with baseline concentrations has not been adequately provided. The reviewer is unsure why the 75th percentile and the median concentration are being compared with the "upper limit of normal range".	The choice of statistics for the COPC selection process could allow COPCs that have originated from the mining activities at the Site to be ignored. While it is appropriate to use a reasonable estimate of the maximum and reasonable estimate of typical exposure in a risk assessment, it is not appropriate in the identification of parameters requiring SSRBCC to be developed.	The purpose of screening for COPCs using maximum concentrations is to ensure that no parameters are excluded from a risk assessment when they should be considered. However, for the purposes of deriving SSRBCCs, if a parameter was not screened into the assessment during the COPC selection process the closure criteria will be the CCME (2015) environmental quality guidelines. This would result in a conservative benchmark for use as closure criteria in the event that parameters were missed in the COPC selection process through the use of a statistic other than the maximum concentration.	CCME. 2015. Canadian Environmental Quality Guidelines - Summary Table. Canadian Council of Ministers of the Environment. http://st-ts.ccme.ca/en/index.html (accessed August 2015).	Phase I Report: Section 2.4.2 (p. 2-14 to 2-15).	The comment is not fully addressed. Please clarify the choice of statistics to be used to identify the COPCs. It is understood for every COPC missed because of the identification process that the Closure Criteria will be set at the CCME EQG; however, transparency in the approach taken for the selection of COPCs should still be provided.
EMAB-30	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.3.2, p. 2-15	It is not clear to the reviewer where surface water samples were taken to represent reference locations.	It would increase transparency to provide figures with the locations so it is clear that reference location are outside the area potentially impacted by the mine.	Please see response to WLWB-7.		Phase I Report: Section 2.4.2 (p. 2-14 to 2-15). Revised document included in support of ICRP V4.	The response to WLWB-7 does not address this comment, nor does it address the concern raised within comment WLWB-7. Additional clarity into the sampling locations should be provided.
EMAB-31	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.3.2, p. 2-15 - p. 2-16.	It is not clear why different statistic endpoints are being used to identify COPCs in surface water. For example, the 95th percentile is being used for the North Inlet and PKCA pond where the 75th percentile is being used for seepage quality from type 1 Rock test piles.	The use of statistics to identify parameters requiring a SSRBCC to be developed is not appropriate. Based on the limited information and rationale, it is not clear whether COPCs have been adequately identified.	The purpose of screening for COPCs using maximum concentrations is to ensure that no parameters are excluded from a risk assessment when they should be considered. However, for the purposes of deriving SSRBCCs, if a parameter was not screened into the assessment during the COPC selection process the closure criteria will be the CCME (2015) environmental quality guidelines. This would result in a conservative benchmark for use as closure criteria in the event that parameters were missed in the COPC selection process through the use of a statistic other than the maximum concentration.	CCME. 2015. Canadian Environmental Quality Guidelines - Summary Table. Canadian Council of Ministers of the Environment. http://st-ts.ccme.ca/en/index.html (accessed August 2015).	Phase I Report: Section 2.4.2 (p. 2-14 to 2-15).	The response does not address the comment and the COPC selection process should be transparent. However, since all parameters missed by the COPC selection process will by default have the CCME EQG as Closure Criteria set, it should not affect the ability of Diavik to meet the closure objectives.
EMAB-32	Environmental Monitoring Advisory Board: From EMAB	Table 2.1-4	There are some errors in the Aquatic Life Guidelines provided in this table.	Please confirm guideline values. For example, the CCME guideline for anthracene, benz(a)anthracene and benzene are incorrect. Please double check all values in this table.	Acknowledged; there were some transcription errors with aliphatics non-chlorinated, anthracene PAHs, benz(a)anthracene PAHs, and benzene in Table 2.1-4 of the Phase I Report. However, the transcription errors are not present in the COPC screening tables presented in Appendix B of the Phase I Report. Therefore, the transcription error does not alter the results of the assessment. Table 2.1-4 will be updated in the next version of the Phase I Report.		Phase I Report: Section 2.4.3, Table 2.4-3 (p. 2-19 to 2-21). Note that Table 2.4-3 in the updated Phase I Report replaces Table 2.1-4 in the previous version of the Phase I Report.	Comment addressed.
EMAB-33	Environmental Monitoring Advisory Board: From EMAB	Table 2.1-4	The use of the Diavik Benchmarks and SSWQO guidelines to identify COPCs is not transparent.	It is not clear to the reviewer where these numbers are derived from or if they are suitable to identify COPCs. Please provide some background information regarding the origin of these guidelines.	Please see response to WLWB-11.		Phase I Report: Section 2.4, Table 2.4-3 (p. 2-19 to 2-21), Section 2.4.3.2 (p. 2-17 to 2-22), Section 2.4.5.2 (p. 2-29 to 2-31), Table 2.4-12 (p. 2-30). Revised document included in support of ICRP V4.	Please see response to WLWB-11.
EMAB-34	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.3.2, p.2-20	The report indicates that for the protection of aquatic life, the NCRP seepage water statistic and the PKCA pond water statistic would be diluted in half to assess the protection of aquatic life. There is no rationale provided for this dilution factor.	A rationale must be provided. For the purposes of developing a risk based concentration, taking into account dilution is not appropriate for the identification of COPCs. Dilution may be appropriate in a risk assessment when estimating a reasonable exposure parameter.	The intent is that the aquatic life criteria would apply at some point in Lac de Gras rather than along a seepage pathway on the East Island. This would be analogous to how currently aquatic life criteria apply at the edge of the initial dilution zone rather than at the discharge from the North Inlet Water Treatment Plant. In this way the NCRP seepage water and the PKC Pond water are equivalent to discharges. However the equivalent of an initial dilution zone has not been established for closure. It seemed too unlikely to compare NCRP seepage or PKC Pond water directly against aquatic life criteria so we selected this very conservative dilution factor.		Phase I Report: Sections 2.4.3.2 (p.2-22 to 2-23), 3.1.1 (p. 3-1), and 3.4 (p. 3-3).	The dilution factor does not appear to be supported and a different approach must be applied or a scientific rationale provided.
EMAB-35	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.3.2, p.2-20	The report indicates that the Diavik specific benchmarks, long term CCME water quality benchmarks for the protection of aquatic life; and site-specific water quality objectives from near-by projects will be used for the secondary screening to identify COPCs that require SSRBCC. The report does not provide the basis for the Diavik mine specific benchmarks, nor does it provide the source or assumptions of site-specific water quality objectives from nearby projects. The reviewer therefore cannot evaluate the appropriateness of using these benchmarks as the toxicological basis for the SSRBCC.	The report needs to be transparent and include the assumptions used in the derivation of the toxicity benchmarks used to develop SSRBCC.	Please see response to WLWB-11.		Phase I Report: Section 2.4, Table 2.4-3 (p. 2-19 to 2-21), Section 2.4.3.2 (p. 2-17 to 2-22), Section 2.4.5.2 (p. 2-29 to 2-31), Table 2.4-12 (p. 2-30). Revised document included in support of ICRP V4.	Please see response to WLWB-11.
EMAB-36	Environmental Monitoring Advisory Board: From EMAB	Table 2.1-5	Typographical error. The footnote indicates there were no COPCs for the protection of aquatic life identified.	Please change footnote to Wildlife.	Acknowledged; the Phase I Report will be updated.		Phase I Report: Section 2.4.3.2, Table 2.4-4 (p. 2-22). Note that Table 2.4-4 in the updated Phase I Report replaces Table 2.1-5 in the previous version of the Phase I Report.	Comment addressed.
EMAB-37	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.3.3, p.2-21	The report indicates that the North Inlet will be separated from Lac de Gras by barriers that prevent fish from entering into the North Inlet. Is this assumption still valid as there has been discussion of evaluating whether this is required.	Please confirm that this assumption is still valid.	Please see response to EMAB-21.		Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 9).	Please see response to comment EMAB-21.
EMAB-38	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.3.3, p. 2-21	The report indicates that lake trout have a large home range and that the 1996 mercury concentrations for lake trout will be used as a baseline.	The report should indicate that the mine started operating in 2003 so that it is transparent that the mercury in the 1996 samples would not be a result of Diavik's operations. This is a transparency issue.	Acknowledged; the Phase I Report will be updated.		Phase I Report: Section 2.4.3.3 (p. 2-23 to 2-24).	Comment addressed.

ID	Reviewer	Topic	Comment	Recommendation	Proponent Response	References/Link to memo	Location in reports	
EMAB-39	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.3.3, p. 2-21	The report references the Near-, Mid- and Far-field station but does not provide context to what or where these are.	The report should provide figures and discuss the methodology to be transparent. Again the consideration of reference concentrations would come into play for the interpretation of the COPC concentration in environmental media but not in the identification of which COPCs required SSRBCC.	Please see response to WLWB-7.		Phase I Report: Sections 2.4.2 (p. 2-14 to 2-15), and 2.4.3.2 (p. 2-17 to 2-23). Revised document included in support of ICRP V4.	The response to WLWB-7 does not address this comment. The addition of figures will increase transparency and should be provided.
EMAB-40	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.3.3., p. 2-21	The report should indicate why only methylmercury and selenium were considered for fish tissue.	Provide enough information to be transparent with decisions and processes.	Fish tissue metal concentrations from Slimy Sculpin and Lake Trout collected from Lac de Gras were compared to fish	Beatty, J. M. and G. A. Russo. 2014. Ambient Water Quality Guidelines for Selenium Technical Report Update. British Columbia Ministry of Environment, Water Protection and Sustainability Branch, Environmental Sustainability and Strategic Policy Division: Victoria, BC. CCME. 2003. Canadian Water Quality Guidelines for the Protection of Aquatic Life: Inorganic Mercury and Methylmercury. In: Canadian Environmental Quality Guidelines, 1999. Canadian Council of Ministers of the Environment: Winnipeg, MB.	Phase I Report: Section 2.4.3.3 (p. 2-23 to 2-24).	The Phase I report still does not address why these two parameters were focused on. Tissue guidelines are derived for parameters with bioaccumulative potential. However, exposure to other parameters in fish tissue that do not bioaccumulate but that are present at concentrations that could be a concern through diet could also be present. Additional justification for limiting the consideration of exposure to COPCs through fish tissue is warranted.
EMAB-41	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.3.4, p. 2-22	The report indicates that exposure to primary producers and aquatic invertebrates could occur in the North Inlet.	Consideration for the potential exposure to birds and mammals in the North Inlet should be given.	As shown in Table 1.1-3 of the Phase II report, the ROCs that could potentially be exposed to COPCs in the North Inlet include: zooplankton, benthic invertebrates, semi-palmated sandpiper, and long-tailed duck. Aquatic mammals such as river otter and mink have not been recorded on-site or at the nearby Ekati project. Therefore, potential exposure was not considered for these aquatic mammals.		Phase I Report: Section 2.1.1 (p. 2-1 to 2-2), and Table 2.1-1 (p. 2-2 to 2-5). Phase II Report: Section 1.1, Table 1.1-3 (p. 1-5).	Comment partially addressed, please refer to EMAB response to comments for EMAB-10 regarding aquatic mammals.
EMAB-42	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.3.4, p. 2-22	The use of the maximum sediment concentration to identify COPCs is appropriate; however, the comparision with baseline reference concentrations is not for the purposes of identifying COPCs that required SSRBCC.	Develop SSRBCC for all parameters in sediment whose maximum concentration exceeds the applicable guidelines	First it is important to note the information referenced above was only used to screen the contaminants where site-specific risk-based criteria would be advanced at this time. This information was not used to estimate post-closure exposure concentrations or evaluate associated risks. The information was also not used to select total COPC for closure. To clarify this, we will add the relevant CCME (or equivalent) criteria for parameters that do not have SSRBCC. Regardless, we understand that reviewers would like more information about the data used to determine which parameters would have SSRBCC. These will be provided in a revised document that will be included in support of ICRP V4. The purpose of screening for COPCs using maximum concentrations is to ensure that no parameters are excluded from a risk assessment when they should be considered. However, for the purposes of deriving SSRBCCs, if a parameter was not screened into the assessment during the COPC selection process the closure criteria will be the CCME (2015) environmental quality guidelines. This would result in a conservative benchmark for use as closure criteria in the event that parameters were missed in the COPC selection process through the use of a statistic other than the maximum concentration.	CCME. 2015. Canadian Environmental Quality Guidelines - Summary Table. Canadian Council of Ministers of the Environment. http://st-ts.ccme.ca/en/index.html (accessed August 2015).	Phase I Report: Sections 2.4 (p. 2-14 to 2-15), 2.4.3.4 (p. 2-25 to 2-26), 3.4 (p. 3-2 to 3-4), and Tables 2.4-8 (p. 2-25 to 2-26) and 2.4-9 (p. 2-26). Revised document included in support of ICRP V4.	The purpose of developing SSRBCC is so that site-specific criteria can be applied to the closure plan as opposed to relying on generic guidelines that may be overly-protective for the specific site. As a result, the identification of COPCs should be inclusive of all mine related COPCs. However, the approach now proposed by Diavik to default to CCME EQG if a SSRBC has not been developed is acceptable and will generally address the concerns of missing COPCs.
EMAB-43	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.5, p. 2-25	All comments provided above regarding using statistics to identify COPCs also applies to the selection of COPCs for human health and will not be repeated	Maximum concenrations should be compared with the applicable guidelines to develop the list of COPCs that SSRBCC need to be derived.	The purpose of screening for COPCs using maximum concentrations is to ensure that no parameters are excluded from a risk assessment when they should be considered. However, for the purposes of deriving SSRBCCs, if a parameter was not screened into the assessment during the COPC selection process the closure criteria will be the CCME (2015) environmental quality guidelines. This would result in a conservative benchmark for use as closure criteria in the event that parameters were missed in the COPC selection process through the use of a statistic other than the maximum concentration.	CCME. 2015. Canadian Environmental Quality Guidelines - Summary Table. Canadian Council of Ministers of the Environment. http://st-ts.ccme.ca/en/index.html (accessed August 2015).	Phase I Report: Section 2.4.2 (p. 2-14 to 2-15).	The purpose of developing SSRBCC is so that site-specific criteria can be applied to the closure plan as opposed to relying on generic guidlines that may be overly-protective for the specific site. As a result, the identification of COPCs should be inclusive of all mine related COPCs. However, the approach now proposed by Diavik to default to CCME EQG if a SSRBC has not been developed is acceptable and will address the concerns of missing COPCs.
EMAB-44	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.5.1, p. 2-25	The CCME soil quality guidelines for the protection of agricultural land use was used to identify COPCs in soil. The report did not discuss whether these guidelines are protective of traditional way of life of Aboriginal peoples.	This uncertainty should be discussed in the report and an interpretation of how this uncertainty could affect the identification of COPCs requiring the development of SSRBCC.	The CCME soil quality guidelines for the protection of agricultural land use (CCME 2015) are designed to maintain a level of ecological functioning that will sustain the primary activity (i.e., food production and harvesting - agriculture) associated with the land use (CCME 2006). Agricultural land use guidelines are often used as ecological protection guidelines for wildlands. The guidelines are derived from laboratory and field toxicity data of chemicals on key ecological receptors (CCME 2006). The generic agricultural soil quality guidelines consider both human health and ecological protection endpoints.Generally protection of ecological receptor health endpoints are drivers of the overall guidelines, these effect endpoints tend to be more sensitive than human health endpoints for many COPCs. The federal guidelines contain uncertainty factors, are conservative in nature, and consider human consumption pathways in their derivation for AL land use. Screening against these guidelines is expected to be protective of variable human consumption exposures. The SSRBCCsoil for human health were specifically derived to protect human health and incorporated the characteristics of local Aboriginal peoples (e.g., consumption rates and exposure times) into the derivation of the SSRBCCs. This uncertainty discussion will be added to the Phase I Report.	CCME. 2006. A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines [Revised]. Report CCME PN 1332. Canadian Council of Ministers of the Environment: Winnipeg, MB. CCME. 2015. Canadian Environmental Quality Guidelines - Summary Table. Canadian Council of Ministers of the Environment. http://st-ts.ccme.ca/en/index.html (accessed August 2015).	Phase I Report: Section 3.4.1 (p. 3-4).	While the reviewer agrees with the response, dermal contact given potable water is a complete exposure pathway and it would increase transparency to indicate in the report that the SSRBCC by protecting for potable water would also be protective of the more minor exposures through dermal contact. As already discussed, Health Canada does provide guidance on sediment contact to human health and this guidance should be considered going forward.
EMAB-45	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.5.2, p. 2-26	The report does not identify dermal contact as an exposure pathway to water. As water is considered potable, bathing and swimming should be considered.	The report should consider dermal contact as a plausible exposure pathway.	Ingestion is the primary route of exposure to inorganic contaminants (e.g., metals) as uptake in the gastrointestinal track is higher than from the skin. Dermal exposure to water that occurs during typical recreational activity is not considered to represent a significant health risk for recreational water users (Health Canada 2012). Inorganic COPCs in water are not significantly taken up via dermal contact, ingestion is the primary route of COPC exposure for human receptors. Currently, Health Canada (2012) only provides recreational water quality guidelines for fecal indicators and physical and aesthetic parameters. Health Canada (2015) advises that the Drinking Water Quality Guidelines be used for health assessment of recreational waters. Health Canada (2010a, 2010b) does not provide equations for the determination of exposure due to dermal contact with water or sediment. Deriving human SSRBCCwater that are based on ingestion rather than dermal contact is a conservative measure as the major route of exposure is assessed, to derive the most sensitive SSRBCC. Health based guidelines for dermal contact with sediment have not been derived by Health Canada. Dermal exposure of the skin (e.g. feet) to sediment during wading or recreational activities is expected to be negigible, as contact would be incidental and of short duration due to the cold temperature of Arctic lakes. Furthermore, COPCs in sediment tend to be bound to particulate matter with limited bioavailability for uptake. The sediment would likely be washed off the feet upon exit of the lake. The short time frame of exposure and the small area of skin exposed suggest that the potential risk to human health is negligible.	Health Canada. 2010a. *Federal Contaminated Site Risk Assessment in Canada, Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA)* . Version 2.0. Revised 2012. Contaminated Sites Division, Safe Environments Directorate: Ottawa, ON. Health Canada. 2010b. Federal Contaminated Site Risk Assessment in Canada, Part V: Guidance on Human Health Detailed Quantitative Risk Assessment for Chemicals (DQRACHEM). Contaminated Sites Division, Safe Environments Directorate: Ottawa, ON. Health Canada. 2012. Guidelines for Canadian Recreational Water Quality, third edition. Water, Air and Climate Change Bureau, Healthy Environments and Consumer Safety Branch, Health Canada: Ottawa, ON. Health Canada. 2015. Guidelines for Canadian Drinking Water Quality - Summary Table. Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment. http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/sum_guide-res_recom/index-eng.php (accessed January 2015).	Phase I Report: Section 2.2.2 (p. 2-8 to 2-9).	It is agreed that Health Canada's drinking water guidelines would be protective of dermal contact while swimming/bathing etc. Health Canada does provide guidelines for sediment contact to humans through recreational activities. And these guidelines should be considered going forward.
EMAB-46	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.5.2, p. 2-26	In the third paragraph, it is stated that the predicted pit lake water quality was used. It is not clear how the water quality was predicted.	Please provide information pertaining to how the water quality was predicted. What assumptions were made and what the uncertainties are.	The reference provided for this information is: DDMI. 2013b. Predictions of water quality in a flooded pit from a pit wall washing study. Diavik Diamond Mines Inc.: Yellowknife, NT. A copy of the document can be found in Appendix II-2 of DDMI 2013.	Diavik Diamond Mines Inc. (DDMI). 2013. Memorandum to Ms. Violet Camsell-Blondin, Chair of the Wek'eezhii Land and Water Board, dated December 31, 2013. Accessed online June 2016 from: http://www.mvlwb.ca/Boards/WLWB/Registry/2007/W2007L2-0003/W2007L2-0003%20-%20Diavik%20-%20ICRP%20-%202013%20Progress%20Report%20-%20Dec%2031_13.pdf	Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 11).	Comment addressed. Providing this information in the SSRBCC documents would increase transparency of the approach taken.
EMAB-47	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.5.2, p. 2-26	It is indicated that parameter concentrations were compared with Diavik Drinking Water benchmarks in favour of Health Canada Drinking Water Guidelines; however, no information on the assumptions or derivation method into the Diavik Drinking Water Benchmarks were provided.	This information must be provided in the report.	Please see response to WLWB-11.		Phase I Report: Section 2.4, Table 2.4-3 (p. 2-19 to 2-21), Section 2.4.3.2 (p. 2-17 to 2-22), Section 2.4.5.2 (p. 2-29 to 2-31), Table 2.4-12 (p. 2-30). Revised document included in support of ICRP V4.	See response to WLB-11
EMAB-48	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.5.2, Table 2.1-13	The Diavik drinking water benchmark was used as a benchmark to exclude lead in water as a COPC for human health. Regulatory agencies are reviewing the science regarding the toxicity of lead. It is believed that no amount of lead is acceptable. Therefore, lead should be retained for a SSRBCC that should be based on natural background conditions.	Lead must be retained for human health and a SSRBCC developed.	SSRBCCs for adults and toddlers were developed for lead due to the ingestion of drinking water. It was determined that the SSRBCCs were 0.0583 and 0.0340 mg/L for adults and toddlers, respectively. The SSRBCCs for adults and toddlers are higher than the Canadian Drinking Water Quality Guideline for lead (0.01 mg/L; Health Canada 2015). The adult and toddler SSRBCCs for lead in water are also greater than the final SSRBCC for water which was 0.006 mg/L for fish. Therefore, the final SSRBCC for lead in water for the Project remains unchanged.	Health Canada. 2015. Guidelines for Canadian Drinking Water Quality - Summary Table. Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment. http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/sum_guide-res_recom/index-eng.php (accessed January 2015).	Phase II Report: Section 3.2, Table 3.2-1 (p. 3-3). Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 12).	Health Canada is revisting the drinking water guidelines for lead, in the meantime, HC is recommending consideration of TRVs from the European Food Safety Authority (EFSA 2010). The guidelines proposed for the SSRBCC for human health and lead may be non-protective.
EMAB-49	Environmental Monitoring Advisory Board: From EMAB	Section 2.4.5.3, p 2-28	The report indicates that fish tissue concentrations of chemicals were compared with the Health Canada fish tissue quality guidelines for fish consumption by humans. The report does not indicate whether the Health Canada guidelines are protective of Aboriginal communities.	A discussion regarding the applicability or uncertainty of using these guidelines to address exposure to Aboriginal communities should be discussed.	The Health Canada (2007) fish tissue quality guideline for mercury for fish consumption by humans (0.5 mg/kg) was applied in the COPC screening process of the Phase I Report (Section 2.4.5.3). The screening process identified mercury as a COPC in fish tissue for human ingestion. The Health Canada (2007) guideline for mercury assumes an average consumption rate of fish (22 grams/day), which may not be protective of Aboriginal communities that consume large amounts of fish. Therefore, the SSRBCCs for fish tissue due to human consumption were compared to the BC MOE (2001) aquatic life guidelines for fish/shellfish when the human diet is based primarily on fish (Section 3.4 of the Phase II Report). The BC MOE provides guidelines for different levels of fish consumption. The BC MOE (2001) aquatic life guideline for fish/shellfish consumption by humans is 0.1 mg/kg ww for high fish consumers, who consume 1,050 grams of fresh fish per week. This level of fish consumption is much higher than the fish consumption rate for adults adopted in the derivation of the SSRBCCfish (0.133 kg/day = 791 g/week), which was obtained from a published study on the traditional food intake in indigenous communities in Denendeh and the Yukon (Batal et al. 2005). Therefore, the use of the BC MOE high fish consumption guideline was protective of Aboriginal communities that consume large amounts of fish. The information presented above will be inserted into the next version of the Phase I Report.	Batal, M., K. Gray-Donald, H. V. Kuhnlein, and O. Receveur. 2005. Estimation of traditional food intake in indigenous communities in Denendeh and the Yukon. International Journal of Circumpolar Health, 64 (1): 46-54. BC MOE. 2001. Ambient Water Quality Guidelines for Mercury: Overview Report - First Update. http://www.env.gov.bc.ca/wat/wq/BCguidelines/mercury/mercury.html (accessed June 2016). Health Canada. 2007. Human Health Risk Assessment of Mercury in Fish and Health Benefits of Fish Consumption. Bureau of Chemical Safety, Food Directorate, Health Products and Food Branch: Ottawa, ON.	Phase I Report: Section 2.4.5.3 (p. 2-32).	Comment addressed.
EMAB-50	Environmental Monitoring Advisory Board: From EMAB	Figure 2.5-1	The Ecological CSM figure contains receptors that are not discussed in the report and does not illustrate food chain transfers that will be considered in the derivation of the SSRBCC. In addition, not all potentially complete exposure pathways are shown.	This information must be provided in the report. Exposure pathways need to be added to the CSM figure.	Acknowledged; the Phase I Report will be updated so that all ROCs in Figure 2.5-1 are described in the report, all food chain transfers and exposure pathways will be shown in Figure 2.5-1.		Phase I Report: Sections 2.1.1 (p. 2-1 to 2-5) and 2.2.1 (p. 2-7 to 2-8); and Figure 2.5-1 (p. 2-34).	Comment addressed.

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EMAB-51	Environmental Monitoring Advisory Board: From EMAB	Figure 2.5-2	The Human Health CSM figure does not identify exposure pathways to impacted media and only indicates a child and adult. No differentiation of potential exposures to the adult are identified (i.e., worker conducting the closure of the Site, Aboriginal community member or local resident/recreational user.	The different uses of the Site should be depicted in the CSM.	Figure 2.5-2 of the Phase II Report depicts exposure pathways as arrows from affected media (i.e., water, soil, country foods) to adults and toddlers. Please note that the adult and toddler shown in Figure 2.5-2 are meant to represent Aboriginal individuals. As described in Section 2.1.2 of the Phase I Report, Aboriginal groups were included as the most sensitive human receptors of concern as the Project is located within the traditional lands of Inuit, Dene, and Métis people. It is expected that they would have the highest exposure to COPCs from the various exposure routes considered due to the amount of time they could potentially spend on the land (i.e., three months of the year as described in Section 1.3.2 of the Phase II Report). During the Closure and Post-closure phases of the Project it is not expected that workers would spend significant periods of time on-site, and they would not be harvesting country foods; therefore, workers would experience fewer exposure pathways than Aboriginal receptors. Furthermore, the health of on-duty workers is addressed by various legislation and health and safety codes. Thus the assessment of Aboriginal receptors ensures that the receptors with the highest potential for exposure are considered, which would result in the most conservative SSRBCCs.		Phase I Report: Sections 2.1.2 (p. 2-5 to 2-6) and 2.2.2 (p. 2-8 to 2-11); and Figure 2.5-2 (p. 2-35). Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 12).	Comment addressed.
EMAB-52	Environmental Monitoring Advisory Board: From EMAB	Section 3, p. 3-1 to 3-3	The uncertainties section does not, for the most part, provide an indication of how the uncertainties could influence the identification of the COPCs and the likelihood of COPCs being missed. The uncertainty section also does not discuss the uncertainty associated with the analytical data, sampling locations, and assumptions used and how these could influence the outcome of the assessment.	Additional details and evaluation of the uncertainties need to be provided so that an interpretation of the acceptability of the uncertainties can be completed.	Acknowledged; Section 3 (Assumptions and Uncertainties) of the Phase I Report will be updated to describe the uncertainty around COPC selection, analytical data, and sampling locations.		Phase I Report: Section 3.4 (p. 3-2 to 3-4).	Comment addressed.
EMAB-53	Environmental Monitoring Advisory Board: From EMAB	Review Comments on ERM Site-Specific Risk-Based Closure Criteria Phase II Report - For Diavik Diamond Mine	Review Comments on ERM Site-Specific Risk-Based Closure Criteria Phase II Report - For Diavik Diamond Mine	Review Comments on ERM Site-Specific Risk-Based Closure Criteria Phase II Report - For Diavik Diamond Mine	No response required.		N/A	N/A
EMAB-54	Environmental Monitoring Advisory Board: From EMAB	TOPIC	COMMENT	RECOMMENDATION	No response required.		N/A	N/A
EMAB-55	Environmental Monitoring Advisory Board: From EMAB	(Be as specific as you think is appropriate; for example a section or page of the document, a recommendation #, general comment, etc.)	(Comments should contain all the information needed for the proponent and the Board to understand the rationale for the accompanying recommendation.)	(Recommendations can be for the proponent or for the Board. Recommendations should be as specific as possible, relating the issues raised in the "comment" column to an action that you believe is necessary.)	No response required.		N/A	N/A
EMAB-56	Environmental Monitoring Advisory Board: From EMAB	Section 1.1, Table 1.1-1	The report indicates that pH of Type I "soil" (is this rock?) is neutral, this assumption could affect the toxicity predictions of aluminum. Data should be provided to support this assumption.	Provide data of Type I "soil" pH.	Two methods for conducting paste pH, per ASTM were used on Type I rock. The first used DI water and obtained pH values that ranged from 4.32 to 9.41, with a mean of 7.14. The second used CaCl to remove the any sorbed exchangeable cations and obtained pH values that ranged from 3.80 to 8.76, with a mean of 6.58. The CaCl method always produces lower pH values. The values are similar to the contact water pH, but caution is warranted with paste pH, in general, as a predictive method. Therefore, the assumption of a neutral pH for Type I rock is valid.		Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 12).	Comment addressed.
EMAB-57	Environmental Monitoring Advisory Board: From EMAB	Table 1.1-2	There are inconsistencies between the parameters retained as COPCs for ROCs in this table and the Phase I report. It is recognized based on the comments in the Phase I report that the COPCs requiring SSRBCC will change.	Please confirm the parameters retained. For example mercury is indicated in the Phase I report as being retained for human health in water, yet Table 1.1-2 does not show this. There are other inconsistencies that have not been summarized.	Acknowledged; the Phase I and II Reports will be updated.		Phase I Report: Section 2.4 (p. 2-14 to 2-33), and Tables 2.4-2 (p. 2-17), 2.4-4 (p. 2-22), 2.4-5 (p. 2-23), 2.4-7 (p. 2-24), 2.4-9 (p. 2-26), 2.4-10 (p. 2-27), 2.4-11 (p. 2-29), 2.4-13 (p. 2-31), 2.4-14 (p. 2-32), and 2.4-15 (p. 2-33). Phase II Report: Section 1.1, Table 1.1-2 (p. 1-4).	It appears that some discrepancies between the Tables still have not been resolved, e.g., iron was not indicated as COPC in Table 1.1-2, but is included as COPC for human receptors in Tables 2.4-13 and 2.4-15.
EMAB-58	Environmental Monitoring Advisory Board: From EMAB	Section 1.3.1, p.1-6	The report indicates that allometric equations for mammals and birds were adopted from ORNL 1997. There has been considerable research in the last decade to evaluate whether these scaling factors are appropriate. The authors should review this data and evaluate whether a different scaling factor is more appropriate.	The use of allometric scaling should be addressed in the uncertainty section of the report.	As described in Section 1.3 of the Phase II report, there are no TRVs available for the mammalian and avian wildlife species present at Diavik, thus, TRVs from toxicity tests on laboratory/common species were considered instead. Environment Canada (2010, 2012) discourages allometric scaling (i.e., scaling of organism characteristics such as ingestion rate based on influence of organism body size) as well as use of safety/uncertainty factors without support of scientific evidence. Therefore, the lowest available toxicity endpoints for available species that were representative of the wildlife ROCs (including birds) were adopted as appropriate TRVs and allometric scaling was not used to develop TRVs for wildlife species. As described in Section 1.3.1 of the Phase II report, only food and water ingestion rates for the wildlife ROCs were based on allometric equations for mammals and birds, which were obtained from the Oak Ridge National Laboratory (ORNL 1997). Environment Canada (2012) Ecological Risk Assessment Guidance states that allometric scaling can be used for organisms for which data on water and food ingestion rates are not available.	ORNL. 1997. Methods and Tools for Estimation of the Exposure of Terrestrial Wildlife to Contaminants. Publication No. 4650. Prepared for the United States Department of Energy, Office of Environmental Policy and Assistance, Air, Water, and Radiation Division by Oak Ridge National Laboratory: Oak Ridge, TN. Environment Canada. 2010. Federal Contaminated Sites Action Plan (FCSAP) Ecological Risk Assessment Guidance - Module 2: Selection or Development of Site-specific Toxicity Reference Values. Government of Canada, Environment Canada: Gatineau, QC. Environment Canada. 2012. Federal Contaminated Sites Action Plan (FCSAP) Ecological Risk Assessment Guidance. Government of Canada, Environment Canada: Gatineau, QC.	Phase II Report: Sections 1.3.1 (p. 1-5), 4.3 (p. 4-2 to 4-3); and Appendix G Section 1.3 (p. 6 of 22).	Comment addressed.
EMAB-59	Environmental Monitoring Advisory Board: From EMAB	Section 1.3.2, p. 1-9	As discussed in the comments of the Phase I Report, exposure to water through bathing and swimming should be considered in the derivation of the SSRBCC, as a result the surface area considered in the calculations will need to be adjusted. In addition, it is not clear why consideration of dust has not been included as a potential exposure pathway to humans. A construction worker receptor should be considered in the derivation of the closure criteria to protect humans doing closure activities and/or maintenance after closure.	Add exposure to swimming and bathing and the construction worker or provide a rationale for the exclusion.	Ingestion is the primary route of exposure to inorganic contaminants (e.g., metals) for humans and exposure that occurs during typical recreational water activities is not considered to represent a significant health risk for recreational water users (Health Canada 2012). Currently, Health Canada only provides guidelines for recreational water quality for fecal indicators and certain physical and aesthetic parameters (Health Canada 2012). When there is suspected chemical contamination of recreational waters, Health Canada advises that the Drinking Water Quality Guidelines (Health Canada 2015) be used for health assessment. Health Canada (2010a, b) does not provide equations for the determination of exposure due to immersion in water; instead Health Canada refers to guidance provided by the United States Environmental Protection Agency (US EPA). Furthermore, absorption of contaminants from water in the gastrointestinal tract is much higher than from the contaminants on the skin, as the skin provides an effective barrier to absorption. Therefore, deriving human SSRBCCs that are based on the ingestion of water rather than dermal exposure to water is conservative as the most sensitive exposure route was considered. Closure criteria for total suspended particles (TSP) have been developed for the Project. It is expected that the Project will meet the closure criteria for TSP and that dust levels during the Closure phase will be minimal. As described in Section 2.1.2 of the Phase I Report, Aboriginal groups were included as the most sensitive human receptors of concern as the Project is located within the traditional lands of Inuit, Dene, and Métis people. It is expected that they would have the highest exposure to COPCs from the various exposure routes considered due to the amount of time they could potentially spend on the land (i.e., three months of the year as described in Section 1.3.2 of the Phase II Report). During the Closure and Post-closure phases of the Project it is not expected that workers would spend significant periods of time on-site, and they would not be harvesting country foods; therefore, workers would experience fewer exposure pathways than Aboriginal receptors. Furthermore, the health of on-duty workers is addressed by various legislation and health and safety codes. Thus the assessment of Aboriginal receptors ensures that the receptors with the highest potential for exposure are considered, which would result in the most conservative SSRBCCs.	Health Canada. 2010a. *Federal Contaminated Site Risk Assessment in Canada, Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA)* . Version 2.0. Revised 2012. Contaminated Sites Division, Safe Environments Directorate: Ottawa, ON. Health Canada. 2010b. Federal Contaminated Site Risk Assessment in Canada, Part V: Guidance on Human Health Detailed Quantitative Risk Assessment for Chemicals (DQRACHEM). Contaminated Sites Division, Safe Environments Directorate: Ottawa, ON. Health Canada. 2012. Guidelines for Canadian Recreational Water Quality, third edition. Water, Air and Climate Change Bureau, Healthy Environments and Consumer Safety Branch, Health Canada: Ottawa, ON. Health Canada. 2015. Guidelines for Canadian Drinking Water Quality - Summary Table. Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment. http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/sum_guide-res_recom/index-eng.php (accessed January 2015).	Phase I Report: Section 2.2.2 (p. 2-8 to 2-9).	Comment addressed.
EMAB-60	Environmental Monitoring Advisory Board: From EMAB	Section 1.3.2, p. 1-9	The derivation of the SSRBCC is relying on a survey conducted by Batal et al., 2005. It does not appear that the Aboriginal communities potentially affected by Diavik mine have been consulted to evaluate whether these fish, wildlife, bird and plant ingestion rates are representative of their lifestyle. This should be completed prior to the calculation of SSRBCC to ensure reasonable assumptions are used.	Get approval of the ingestion rates and quantities by the potentially affected Aboriginal community or complete a fact-finding study to develop site-specific values. GNWT Dept. of Environment and Natural Resources and the Wek'èezhìi Renewable Resources Board have responsibilities to monitor such information and may be able to provide data to assist.	Health Canada (2010) recommends that human receptor characteristics be obtained from Richardson (1997) for use in Human Health Risk Assessments (HHRAs). However, alternate data sources can be used if they are more site-specific as long as they are clearly cited and fully referenced (Health Canada 2010). Because the data presented in Richardson (1997) is over 20 years old and represents a compilation of Aboriginal groups across Canada, a literature search was conducted to obtain site-specific information on country foods ingested, their frequency of ingestion, and the serving sizes ingested. Batal et al. (2005) published a study on the traditional food intake in indigenous communities in Denendeh and the Yukon. Since the information provided by Batal et al. (2005) was much more recent and site-specific than that provided by Richardson (1997), it was used in the development of SSRBCCs for human receptors.	Batal, M., K. Gray-Donald, H. V. Kuhnlein, and O. Receveur. 2005. Estimation of traditional food intake in indigenous communities in Denendeh and the Yukon. *International Journal of Circumpolar Health* , 64 (1): 46-54. Health Canada. 2010. Federal Contaminated Site Risk Assessment in Canada, Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA). Version 2.0. Revised 2012. Contaminated Sites Division, Safe Environments Directorate: Ottawa, ON. Richardson, G. M. 1997. Compendium of Canadian Human Exposure Factors for Risk Assessment O'Connor Associates Environmental Inc.: Ottawa, ON.	Phase II Report: Section 1.3.2 (p. 1-5 to 1-9).	The approach is acceptable, however, consultation with the local communities would reduce uncertainty and provide a more realistic basis for the derivation of the SSRBCC.
EMAB-61	Environmental Monitoring Advisory Board: From EMAB	Section 2, p. 2-1	It is not clear why TRVs from reputable agencies were not adopted if available.	Please clarify and provide a rationale.	As stated in Section 2 of the Phase II Report, a database and literature search provided appropriate TRVs for each COPC identified in the different environmental media. The database and literature search for TRVs considered the following reputable agencies: - technical appendices included in the CCME guidelines (CCME 2015); - United States Environmental Protection Agency (US EPA) Ecotox Database (US EPA 2016a); - US EPA Integrated Risk Information System (IRIS; US EPA 2016b); - US EPA Ecological Soil Screening Level (Eco SSL) documents (US EPA 2003); - Agency for Toxic Substances and Disease Registry (ATSDR 2016); - Health Canada guidance documents for human health risk assessments (Health Canada 2010b, 2010a, 2011); - Oak Ridge National Laboratory (ORNL) toxicological benchmarks for wildlife (Sample, Opresko, and Suter II 1996); and - primary literature.		Phase II Report: Section 2.2 (p. 2-1 to 2-2), and Appendix G (p. 1 to 22).	Comment addressed.

ID	Reviewer	Topic	Comment	Recommendation	Proponent Response	References/Link to memo	Location in reports	
EMAB-62	Environmental Monitoring Advisory Board: From EMAB	Section 2, p. 2-2	The reports states that "The TRVs for wildlife and human ROCs are based on daily exposure that could occur over a lifetime without causing measurable adverse effects to individuals that could lead to a reduction in population". It is not appropriate to protect human health based on effects to the human population.	Please clarify this sentence.	Acknowledged; the Phase II Report will be updated to say: The TRVs for wildlife ROCs are based on daily exposure that could occur over a lifetime without causing measurable adverse effects to individuals that could lead to a reduction in population. The protection goal guiding the human health risk assessment is the protection of individual human receptors from adverse health effects from exposure to contaminants in site media. Adverse effects on the health of an individual are deemed to be unacceptable in this assessment.		Phase II Report: Section 2.1 (p. 2-1).	Comment addressed.
EMAB-63	Environmental Monitoring Advisory Board: From EMAB	Table 2-1	The report indicates that the CCME probable effect levels were used as SSRBCC. It is unclear why a SSRBCC would be set to a concentration where adverse effects would be expected. The threshold effect level would be a more appropriate benchmark.	PELs are not appropriate to be used for SSRBCC; we suggest the use of threshold effect level or interim guideline if site specific standards are not developed.	Acknowledged; the Phase II Report will be updated.		Phase II Report: Appendix G (p. 1 to 4).	Comment addressed.
EMAB-64	Environmental Monitoring Advisory Board: From EMAB	Section 3.2, p.3-2	The report indicates that molybdenum does not require assessment for drinking water.	Additional information for this exception is required, including the evaluation of other jurisdictions' drinking water guidelines.	Health Canada does not provide a Drinking Water Quality Guideline for molybdenum; therefore, molybdenum was not considered as a COPC in drinking water for humans. Most Canadian provinces and territories have not established drinking water quality guidelines and instead defer to the Canadian Drinking Water Quality Guidelines (Health Canada 2015). The BC MOE has established drinking water quality guidelines, most of which are the same as those promoted by Health Canada (2015). However, the BC MOE established a drinking water quality guideline for molybdenum (0.25 mg/L; BC MOE 2016), which Health Canada has not done. Therefore, as requested, SSRBCCs for adults and toddlers were developed for molybdenum due to the ingestion of drinking water. It was determined that the SSRBCCs were 0.458 and 0.219 mg/L for adults and toddlers, respectively. The SSRBCC for toddlers is lower than the BC MOE drinking water quality guideline; however, it is higher than the lowest SSRBCC for molybdenum in water, which was 0.073 mg/L for fish. Therefore, the final SSRBCC for molybdenum in water for the Project would remain unchanged even if molybdenum in drinking water was considered. The Phase I Report will be updated so that the rationale for excluding molybdenum is more transparent.	BC MOE. 2016. Approved Water Quality Guidelines. http://www2.gov.bc.ca/gov/topic.page?id=044DD64C7E24415D83D07430964113C9 (accessed April 2016). Health Canada. 2015. Guidelines for Canadian Drinking Water Quality - Summary Table. Federal-Provincial-Territorial Committee on Drinking Water of the Federal-Provincial-Territorial Committee on Health and the Environment. http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/sum_guide-res_recom/index-eng.php (accessed January 2015).	Phase I Report: Section 2.4.5.2 (p. 2-31). Phase II Report: Section 3.2 (p. 3-2).	Comment addressed.
EMAB-65	Environmental Monitoring Advisory Board: From EMAB	Section 3.4, p.3-2	the BC MOE tissue residue guideline for fish/shellfish consumption by humans was adopted. It is not clear if the BC guidelines consider the fish consumption quantities and frequency ingested by Aboriginal people.	Please provide the rationale on the derivation of these guidelines and evaluate the appropriateness of their use.	The Health Canada (2007) fish tissue quality guideline for mercury for fish consumption by humans (0.5 mg/kg) was applied in the COPC screening process of the Phase I Report (Section 2.4.5.3). The screening process identified mercury as a COPC in fish tissue for human ingestion. The Health Canada (2007) guideline for mercury assumes an average consumption rate of fish (22 grams/day), which may not be protective of Aboriginal communities that consume large amounts of fish. Therefore, the SSRBCCs for fish tissue due to human consumption were compared to the BC MOE (2001) aquatic life guidelines for fish/shellfish when the human diet is based primarily on fish (Section 3.4 of the Phase II Report). The BC MOE provides guidelines for different levels of fish consumption. The BC MOE (2001) aquatic life guideline for fish/shellfish consumption by humans is 0.1 mg/kg ww for high fish consumers, who consume 1,050 grams of fresh fish per week. This level of fish consumption is much higher than the fish consumption rate for adults adopted in the derivation of the SSRBCCfish (0.133 kg/day = 791 g/week), which was obtained from a published study on the traditional food intake in indigenous communities in Denendeh and the Yukon (Batal et al. 2005). Therefore, the use of the BC MOE high fish consumption guideline was protective of Aboriginal communities that consume large amounts of fish. The Phase I Report will be updated so that the rationale/appropriateness of the BC MOE fish tissue guidelines is more transparent.	Batal, M., K. Gray-Donald, H. V. Kuhnlein, and O. Receveur. 2005. Estimation of traditional food intake in indigenous communities in Denendeh and the Yukon. International Journal of Circumpolar Health, 64 (1): 46-54. BC MOE. 2001. Ambient Water Quality Guidelines for Mercury: Overview Report - First Update. http://www.env.gov.bc.ca/wat/wq/BCguidelines/mercury/mercury.html (accessed June 2016). Health Canada. 2007. Human Health Risk Assessment of Mercury in Fish and Health Benefits of Fish Consumption. Bureau of Chemical Safety, Food Directorate, Health Products and Food Branch: Ottawa, ON.	Phase I Report: Section 2.4.5.3 (p. 2-32).	Comment addressed.
EMAB-66	Environmental Monitoring Advisory Board: From EMAB	Section 4.2, p. 4-2	The last paragraph regarding toxicity benchmarks for human health is incorrect. The uncertainty factors applied are based on extrapolation from species to species and based on confidence of the study design. It is not associated with assumptions regarding differential susceptibility to toxicants.	Please revise or remove sentence.	Acknowledged; the Phase II Report will be updated.		Phase II Report: Section 4.2 (p. 4-2).	Comment addressed.
EMAB-67	Environmental Monitoring Advisory Board: From EMAB	Appendix A, p. 9	The report indicates the peregrine falcon and bald eagle would only be exposed to water and therefore it was assumed that 100% of their exposure was from water. Both birds are active hunters and water would not be the only exposure pathway. This assumption is also not consistent with the Phase I report.	Revise the assumptions for the peregrine falcon and bald eagle to be representative of these receptors.	As shown in Tables 1.1-2 and 1.1-4 of the Phase II report, peregrine falcon and bald eagle were considered to be potentially exposed to COPCs in water and fish tissue. The SSRBCC equations for fish consumption are provided in Table 1.2-1 of the Phase II report. The details on the SSRBCC for fish tissue are provided in Section 3.4 of the Phase II report. Details of the equation used in the calculation of SSRBCCs due to fish tissue ingestion are provided in Section 1.4 of Appendix A in the Phase II report.		Phase II Report: Tables 1.1-2 (p. 1-3) and 1.1-4 (p. 1-5); Appendix A (p. 9 to 10).	Consideration of exposure to COPCs through mammals and birds (exposed to soil COPCs) should also be given for these receptors.
EMAB-68	Environmental Monitoring Advisory Board: From EMAB	Appendix A, p. 9	The fact that mercury is not a COPC in water does not preclude the necessity to evaluate fish consumption of any receptor that consumes fish.	Add the assessment of mercury in fish tissues to all receptors that consume fish.	As shown in Table 1.1-4 of the Phase II report, methylmercury in fish tissue was considered for grizzly bear, peregrine falcon, bald eagle, and humans. The SSRBCC equations for fish consumption are provided in Table 1.2-1 of the Phase II report. The details on the SSRBCC for fish tissue are provided in Section 3.4 of the Phase II report. Details of the equation used in the calculation of SSRBCCs due to fish tissue ingestion are provided in Section 1.4 of Appendix A in the Phase II report.		Phase II Report: Section 3.4 (p. 3-6); Tables 1.1-4 (p. 1-5) and 1.2-1 (p. 1-6 to 1-8); and Section 1.4 of Appendix A (p. 13 to 14). Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 14).	Comment addressed.
EMAB-69	Environmental Monitoring Advisory Board: From EMAB	Appendix A, p. 9	In the derivation of the SSRBCC for ecological receptors, the Phase II report had assumed an exposure duration for migratory and hibernating animals less than 100%. However, consideration for exposure of these animals to COPCs while off the Site does not appear to have been considered.	Please clarify the approach taken and provide details of assumptions.	The time spent on-site for the wildlife ROCs was defaulted to 1.0, thus the text in Section 1.3.1 of the Phase II Report will be updated to remove consideration for exposure time. Assuming that ROCs spent all of their time on-site is a conservative measure that will ensure ROCs are not exposed to potentially harmful concentrations of COPCs.		Phase II Report: Section 1.3.1 (p. 1-5).	Comment addressed.
EMAB-70	Environmental Monitoring Advisory Board: From EMAB	Appendix E, p. 1	The Phase I Report identified the presence of Northern pike in Lac de Gras.	Please confirm whether the Phase I report or Appendix E needs to be updated.	Acknowledged; Appendix E in the Phase II Report will be updated so that it includes Northern Pike.		Phase II Report: Appendix E (p. 1 of 1).	Comment addressed.
EMAB-71	Environmental Monitoring Advisory Board: From EMAB	Appendix G	##	The Phase II report provide a detailed rationale and support for the TRV selection.	Acknowledged; the Phase II Report will be updated.		Phase II Report: Section 2 (p. 2-1 to 2-7). Phase II Report, Appendix G (p. 1 to 22). Phase II Report Appendix H (Aquatic Life Toxicity Studies; 20 pp.). Detailed explanation in memo to Ms. Violet Camsell-Blondin of June 2016 (p. 20-24).	The additional information requested regarding the Diavik Benchmarks and the AEMP could not be found. For transparency, the approach used in the derivation of these guidelines should be provided in this document so the basis can be reviewed to determine the adequacy of using these guidelines as Closure Criteria.
EMAB-72	Environmental Monitoring Advisory Board: From EMAB	Appendix G	The aquatic benchmark for arsenic is based on an EC50 .	Please provide a rationale why a SSRBCC is set a concentration where an adverse effect is measured in 50% of the population.	Refer to the response in the attached document. Results will be incorporated into the next phase of the report.	**See attachment**	Phase II Report: Section 2.2 (p. 2-1 to 2-5); and Section 1.1 of Appendix G (p. 1 to 3 of 22). Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 26).	Additional information is required to support the removal of the uncertainty factor. Consideration for differential susceptibilities of species not tested for in standardized toxicity testing as well as variability upon individual responses to chemical exposure should be discussed. Otherwise, the uncertainty factor should be applied and the CCME EQG relied upon.
EMAB-73	Environmental Monitoring Advisory Board: From EMAB	Appendix G	Based on the limited information provided for each of the aquatic benchmarks, a review into the adequacy of the benchmark per parameter could not be completed. The available toxicity information for species present in Lac De Gras or appropriate surrogates should be summarized, with the experimental details (outlined above), the endpoints measured and the reliability of the data. The CCME provides guidelines for evaluating the studies as primary, secondary or unsatisfactory.	Provide a toxicity summary and evaluation for all available data. A spreadsheet format would be a suitable format for the compilation of this information. The selection process should indicate how sensitive species are considered.	Acknowledged; the Phase II Report will be updated and the requested information included as an Appendix.		Phase II Report: Section 2 (p. 2-1 to 2-7). Phase II Report, Appendix G (p. 1 to 22). Phase II Report Appendix H (Aquatic Life Toxicity Studies; 20 pp.). Detailed explanation in memo to Ms. Violet Camsell-Blondin of June 2016 (p. 20-24).	Review of the details provided in Appendix H was outside of Arcadis' scope of work.
EMAB-74	Environmental Monitoring Advisory Board: From EMAB	Appendix G	The use of a geomean of EC50 concentrations is not appropriate to protect terrestrial plant species (i.e., for Chromium). EC15 to EC20 should be used to develop appropriate guideline values protective of these receptors. The geo-mean of an effects based concentration of multiple species toxicity tests (i.e., for Molybdenum protection of plants) will also not protect the more sensitive species. Please revise the approach.	The approach using the geomean of EC50 concentrations does not offer sufficient protection. Please revise approach.	As described in Section 2 of the Phase II Report, effect concentrations (EC_x) or effect doses (ED_x) were preferred as endpoints for TRVs, as recommended by Environment Canada (2010) and the CCME (2007). The preference ranking for toxicity endpoints is in the following order (CCME 2007): Most appropriate ECx/ICx representing a low-effects threshold > $EC_{15\text{-}25}/IC_{15\text{-}25}$ > LOEC > MATC > $EC_{26\text{-}49}/IC_{26\text{-}49}$ > nonlethal EC_{50}/IC_{50} > LC_{50} Every effort was made to obtain low-effects threshold TRVs; however, only EC_{50} thresholds for chromium were found for terrestrial plant species and none of the species are found at the Project site (i.e., all the toxicity tests for plants were conducted on agricultural species). The US EPA (2003) guidance document for developing ecological soil screening levels (Eco-SSLs) indicates that for plants, the Eco-SSL is equal to the geometric mean of EC_{25} or EC_{10} values, where available. Therefore, the chromium TRV for plants was the geometric mean of available toxicity studies (which had EC_{50} endpoints) for species that are not found on the Project site. The TRV for molybdenum followed the US EPA Eco-SSL guidance, as it was a geometric mean of available toxicity studies (which had EC_{10} endpoints) for species that are not found on the Project site.	CCME. 2007. *A Protocol for the Derivation of Water Quality Guidelines for the Protection of Aquatic Life 2007* . In: Canadian Environmental Quality Guidelines, 1999. Canadian Council of Ministers of the Environment: Winnipeg, MB. Environment Canada. 2010. Federal Contaminated Sites Action Plan (FCSAP) Ecological Risk Assessment Guidance - Module 2: Selection or Development of Site-specific Toxicity Reference Values. Government of Canada, Environment Canada: Gatineau, QC. US EPA. 2003. Guidance for Developing Ecological Soil Screening Levels (Eco-SSLs). OSWER Directive 9285.7-55. United States Environmental Protection Agency: Washington, DC.	Phase II Report: Section 2.2 (p. 2-1 to 2-5); and Section 1.2 of Appendix G (p. 5 and 6 of 22).	Toxicity testing follows standardized test protocols and defined test species. Toxicity benchmarks are derived to be protective of most species that could be present and it is impossible to conduct toxicity tests on all species that may be present. Therefore, excluding toxicity data because the test species is not present is not appropropriate unless you can demonstrate that the species could not be representative of a surrogate species that is present on the site. For example, exclusion of a coldwater fish species if it is demonstrated that the waterbody is not a cold water habitat could be supported. Therefore all data should be included in the determination of the toxicity benchmarks unless it can be demonstrated that species on -site would have differential toxicity. The use of a geomean of an EC10 is supported as the protection is for the majority of species but not all, the use of a geomean on an EC50 as a benchmark protective of all organsims is not supported. The benchmarks as derived will not meet the level of protection required to meet the closure objectives.
EMAB-75	Environmental Monitoring Advisory Board: From EMAB	Appendix G	The TRV for 2-Methylnapthalene for birds should have considered an uncertainty factor for using a LOAEL. A TRV of 165.3 mg/kg BW would be more appropriate and offer the same level of protection granted from the other TRVs adopted for birds exposed to other COPCs.	Consider applying the UF or provide a scientific rationale why this is not required.	The 2-Methylnapthalene TRV of 1,653 mg/kg BW for birds is in fact a NOAEL, as reported in the US EPA (2007) ECO-SSL document for total polycyclic aromatic hydrocarbons (PAHs). Since the TRV is not a LOAEL as stated in the Phase II Report, an uncertainty factor is not required because effects in birds were not observed at a 2-Methylnapthalene concentration of 1,653 mg/kg BW. Other avian TRVs for 2-Methylnapthalene could not be found in the literature, thus adopting a NOAEL as a TRV is a conservative measure. The Phase II Report will be updated to indicate that the avian TRV for 2-Methylnapthalene is a NOAEL instead of a LOAEL.		Phase II Report: Section 1.4.12 of Appendix G (p. 10 of 22).	Comment addressed.

ID	Reviewer	Topic	Comment	Recommendation	Proponent Response	References/Link to memo	Location in reports	
EMAB-76	Environmental Monitoring Advisory Board: From EMAB	Appendix G	The TRVs for birds for Acenapthene, Acenaphthylene, Naphthalene and Pyrene require revisions to be specific to birds and to offer the level of protection offered by other TRVs and/or requires a robust rationale why TRVS developed for mice/rats would be appropriate for the protection of birds.	Please provide rationale or revise approach.	As stated in Section 1.4.15 of the Phase II Report, the avian TRV for Naphthalene was obtained from a study on bobwhite (Landis Assoc. Inc. 1985) reported in the USA EPA (2007) Eco-SSL document for polycyclic aromatic hydrocarbons (PAHs). The TRV of 1,653 mg/kg BW/day is based on an NOAEL for growth effects (US EPA 2007). Since this study was conducted on bobwhite (*Colinus virginianus*; a species of quail), the TRV is appropriate for the protection of birds. As stated in Sections 1.4.13, 1.4.14, and 1.4.16 of the Phase II Report, avian TRVs for Acenapthene, Acenaphthylene, and Pyrene are not available in the published literature. In the absence of TRVs for birds, mammalian TRVs were adopted. Section 4.5 of the Environment Canada (2012) guidance document on ecological risk assessment advocates against the use of uncertainty factors (or safety factors) in establishing toxicity reference values. Therefore, uncertainty factors were not applied to mammalian TRV and instead the mammalian TRVs were adopted for birds.	Environment Canada. 2012. *Federal Contaminated Sites Action Plan (FCSAP) Ecological Risk Assessment Guidance* . Government of Canada, Environment Canada: Gatineau, QC. Landis Assoc. Inc. 1985. A dietary LC50 study in the bobwhite with naphthalene (final report). EPA/OTS; Doc #86-870000551. n.p. US EPA. 2007. Ecological Soil Screening Levels for Polycyclic Aromatic Hydrocarbons (PAHs). OSWER Directive 9285.7-78. United States Environmental Protection Agency, Office of Solid Waste and Emergency Response: Washington, DC.	Phase II Report: Section 1.4 of Appendix G (p. 10 and 11 of 22).	The use of mammalian TRVs for Avian receptors needs to be supported. The use of surrogate parameters with avian TRVs would be a more defensible approach.
EMAB-77	Environmental Monitoring Advisory Board: From EMAB	Appendix G, Table G-5	Please confirm the TRVs for Methylmercury, Molybdenum and Selenium as there appear to be errors.	Confirm TRVs.	The TRVs for methylmercury were obtained from Health Canada (2011), where they were reported as 0.47 µg/kg BW/day for the general population and 0.23 µg/kg BW/day for infants, children, and women that are pregnant or of childbearing age. The units of the TRVs were converted to 0.00047 mg/kg BW/day for the adults and 0.00023 mg/kg BW/day for toddlers, as shown in Appendix G-5 of the Phase II Report. The TRVs for molybdenum were obtained from Health Canada (2010). However, please note that the units presented in Table 1 of Health Canada (2010) are incorrect (28 and 23 mg/kg BW/day for adults and toddlers, respectively) but the units presented in Appendix A of Health Canada (2010) are in the correct units (28 and 23 µg/kg BW/day). The correct values were converted to 0.0280 and 0.0230 mg/kg BW/day for adults and toddlers, respectively, as shown in Appendix G-5 of the Phase II Report. The TRVs for selenium were obtained from Health Canada (2010). However, please note that the units presented in Table 1 of Health Canada (2010) are incorrect (5.7 and 6.2 mg/kg BW/day for adults and toddlers, respectively) but the units presented in Appendix A of Health Canada (2010) are in the correct units (5.7 and 6.2 µg/kg BW/day). The correct values were converted to 0.0057 and 0.0062 mg/kg BW/day for adults and toddlers, respectively, as shown in Appendix G-5 of the Phase II Report.	Health Canada. 2010. *Federal Contaminated Site Risk Assessment in Canada, Part II: Health Canada Toxicological Reference Values (TRVs) and Chemical-Specific Factors* . Version 2.0. Contaminated Sites Division, Safe Environments Directorate: Ottawa, ON. Health Canada. 2011. Toxicological Reference Values, Estimated Daily Intakes or Dietary Reference Values for Trace Elements. Obtained from Chemical Health Hazard Revised March 2011, unpublished: Ottawa, ON.	Phase II Report: Section 1.5 of Appendix G (p. 11 to 16 of 22); and Table G-5 (p. 12 of 22).	Comment addressed.
EMAB-78	Environmental Monitoring Advisory Board: From EMAB	Appendix G, Table G-5	Arsenic is a non-threshold contaminant but it does not appear that it has been considered so in the derivation of the SSRBCC.	Please confirm the approach and TRVs used for the assessment of Arsenic.	An HHRA was not conducted in the derivation of SSRBCCs. However, arsenic was not selected as COPC in soil for human receptors and the derivation of the Canadian Drinking Water Quality Guidelines for arsenic does not consider carcinogenicity. Therefore, to be consistent with the Canadian Drinking Water Quality Guidelines, the non-threshold nature of arsenic was not considered in the derivation of the SSRBCC.		N/A	The basis of MAC for the drinking water guideline is cancer (lung, bladder, liver and skin). Therefore, the original comment has not been addressed.
EMAB-79	Environmental Monitoring Advisory Board: From EMAB	Phase 1 report comments - ID# 3-53; Phase 2 comments - ID# 56-78	For clarification, EMAB comments with ID numbers 3-53 are on the Phase 1 report and ID numbers 56-78 are on the Phase 2 report.	None	Acknowledged, no response required.		N/A	N/A
DFO-1	Fisheries and Oceans Canada: Julie Marentette	General	Fisheries and Oceans Canada - Fisheries Protection Program (DFO-FPP) has reviewed the Risk Based Closure Criteria Report according to its mandate and has no comments. DFO-FPP will thus not be participating in workshops concerning this Report.	None	Acknowledged, no response required.		N/A	N/A
ENR-1	GNWT - ENR: Central Email GNWT	Topic 1: Risk Based Approach	Diavik Diamond Mining Inc. (DDMI) is proposing to use a risk assessment-based approach to develop closure criteria for the Diavik site. ENR notes that this strategy may result in criteria for some sediment and water quality parameters that are higher than what occurs naturally in the Lac de Gras and guidelines established by CCME. ENR is concerned with the application of a risk-based approach because the closure criteria will determine the environmental conditions that will remain at the Diavik site throughout the post-closure period, which could extend for a significant period of time. Numerical closure criteria that are established for water, sediment, soils, and other environmental media are dependent on the closure objectives that are established for the site. The NWT Water Strategy includes considerations for water managers in the NWT which are highlighted in the Guiding Principles (Sustainability) and in the Strategy's Goals. A key Principle of the Strategy is that any water stewardship decisions maintain the ability of current and future generations to choose their way of life. The Strategy states that water quality in the NWT remain clean, clear and substantially unaltered for future generations. ENR is concerned that sole reliance upon a risk-based approach for determining closure criteria would result in criteria that may not necessarily protect the aquatic ecosystem to an appropriate level following the closure of the mine. Further discussion in this regard is needed prior to making a decision on approach. To this end, ENR is appreciative that the Board will be hosting a workshop to discuss the development of closure criteria for the Diavik Diamond Mine on June 10, 2016. This discussion will better inform the Board on this issue. Following the workshop, reviewers should be provided with another opportunity to provide written input on this issue to the Board.	1) ENR is concerned with reliance on a risk based approach to derive closure criteria and recommends that further discussion occur about this approach along with rationale at the upcoming workshop scheduled for June 10, 2016.	DDMI would like to note for the Board that ENR appears to caution that they may not accept site-specific or risk-based closure criteria. We believe that it is imperative that this position be clarified as soon as possible and certainly before DDMI expends any further effort or incurs any additional cost with regard to closure criteria development. Board assistance in this matter would be appreciated.		N/A	N/A
ENR-2	GNWT - ENR: Central Email GNWT	None	None	2) ENR recommends, that to facilitate discussions at the workshop, DDMI should describe which parts of the DDMI mine site may or may not be able to reasonably and practically achieve CCME guidelines or better.	The purpose of the Phase I and II Reports was the derivation of SSRBCCs, it was not to provide information on predicted levels of COPCs during the Closure phase of the Project. Therefore, the predicted achievement of CCME guidelines or better is outside the scope of the reports and will not be commented on at this time.		N/A	N/A
ENR-3	GNWT - ENR: Central Email GNWT	None	None	3) It is recommended that, following the workshop, the Board should provide reviewers with another opportunity to provide written comments on this issue.	Acknowledged. No response is required		N/A	N/A
Lands-1	GNWT - Lands: Tracy Covey	Phase I Report. p. 2-28. "It was assumed that no fish will be present at North Inlet during closure".	It's not inconceivable that fish would be present and consumed from the NI; It would seem to be prudent to also consider this likelihood (though unlikely) in the assessment. Such results might identify an area or activity which needs to be excluded for human safety reasons.	Consider the scenario whereby human receptors eat fish from the North Inlet.	Fish are not present in the North Inlet. As stated in Sections 1.2 and 1.3 of the Phase I Report, the derivation of SSRBCC is not the same as a risk assessment and exposure assessment and risk characterization components have not been included at the request of DDMI. Therefore, a scenario whereby human receptors eat fish from the North Inlet was not included, as that would be a part of a risk assessment. However, a human SSRBCC for methylmercury in fish tissue was derived in Section 3.4 of the Phase II Report.		N/A. Phase II Report: Section 3.4 (p. 3-6) and Table 3.4-1 (p. 3-7).	The water in the North Inlet is in exchange with water with Lac de Gras, therefore water quality in the North Inlet should consider the protection of fish for human and ecological consumption.
WLWB-1	WLWB: Anneli Jokela	Phase I Report: Section 1.0 Introduction	THE CLOSURE CRITERIA REPORT DOES NOT PROVIDE INFORMATION REGARDING THE STATUS OF THE RISK-BASED CRITERIA. The introduction does not provide context regarding the status of the proposed risk-based criteria, in particular whether the criteria would be updated during the remaining years of operation. This is important as the number of contaminants of potential concern (COPC) with proposed risk-based criteria and their values could change. For example, the Annual Interim Closure and Reclamation Plan Progress Report – 2015 (revised) indicates that monitoring of environmental media and materials is ongoing. Would the results of the monitoring eventually be used to refine the risk-based criteria? If the criteria change another assessment of the report will be required. As another example, throughout Section 2.4.3, DDMI explains that data from 2007 to 2013 at the NF and MF locations is being used as representative of conditions at closure; however, Mine operations are not scheduled to be completed for a number of years and some environmental parameters have shown increasing trends through time. Thus, maximum concentrations of variables may not have been reached yet. Does the selection of data from 2007 to 2013 still represent an appropriate estimate of closure conditions if concentrations of variables significantly increase betweeen then and Closure?	Please clarify DDMI's plans to update the proposed risk-based criteria during the remaining years of operations (i.e. using monitoring data, etc.). Describe how this would be done and provide expected timelines.	The number of COPC with site-specific risk-based criteria and the value of the criteria can and will change with new information. SSRBCC could be developed for additional COPC if ongoing monitoring and/or estimates of post-closure exposure conditions identify additional COPC. SSRBCC values could change with new toxicological information and/or refinements to assumed exposure DDMI expects that updates will be triggered during the evaluation of estimates of post-closure exposure concentrations for each closure area. There is no fixed timeline for this but as estimates become available the criteria will be evaluated and additional or revised SSRBCC proposed if warranted. DDMI expects these updates would be communicated through the annual ICRP Progress Report. While final closure criteria will be included with the Final Closure Plan, it should be noted that post-closure monitoring could also trigger a need to update SSRBCC.		N/A	Response does not influence comments, but Diavik should commit to having any changes reviewed prior to implementation.
WLWB-2	WLWB: Anneli Jokela	Phase I Report: Section 1.0 Introduction	THE TEMPORAL AND SPATIAL SCALE OF THE CLOSURE CRITERIA REPORT IS UNCLEAR. Temporal scale is important with respect to modelling predicted surface water concentrations upon mine closure and post closure. The spatial scale has been discussed in the Problem Formulation Section as related to sub-areas of the mine site which will be addressed during closure but does not include exposure areas for ecological or human receptors.	Provide clarification on the temporal and spatial scale of the report.	The spatial scale described in the Problem Formulation Section of the Phase I Report (Section 2.3) as related to sub-areas of the mine site applies to ecological and human ROCs. Therefore, the entire Project site is the exposure area (or spatial scale) for ecological and human ROCs. The temporal scale of the report is the Closure and Post-closure phases of the Project.		Phase I Report: Section 2.3 (p. 2-11 to 2-13).	Response does not influence previous comments made.
WLWB-3	WLWB: Anneli Jokela	Phase I Report: Section 2.0 Problem Formulation	THE LEVEL OF PROTECTION ATTRIBUTED TO THE ECOLOGICAL RECEPTOR OF CONCERNS (ROCs) IS NOT SPECIFIED IN THE PROBLEM FORMULATION. The Federal Contaminated Sites Action Plan (FCSAP) for Ecological Risk Assessment Guidance (Environment Canada 2012) recommends that protection goals, and acceptable effects levels (AELs) be included in problem formulation. These may differ for different receptor groups (e.g. aquatic life communities, wildlife) and for different species (e.g., listed versus non-listed species). Protection goals and acceptable effects levels for ecological receptors need to be clarified when developing risk-based criteria.	Has DDMI established or considered protection goals and acceptable effects levels into the problem formulation? If not, can DDMI provide rationale for why these would not be necessary?	Please see response to WLWB-16.		Phase II Report: Section 2.1 (p. 2-1), and Table 2.1-1 (p. 2-3). Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 42-47).	Please see response to comment WLWB-16.

ID	Reviewer	Topic	Comment	Recommendation	Proponent Response	References/Link to memo	Location in reports	
WLWB-4	WLWB: Anneli Jokela	Phase I Report: Section 2.0 Problem Formulation, Sub-section 2.1.1. Potential Ecological Receptor and Section 2.0 Problem Formulation, CSM Figures 2.5-1 and 2.5-2	THE CONCEPTUAL SITE MODELS (CSM) AND THE SELECTION OF ECOLOGICAL RECEPTORS OF CONCERN (ROC) IS INCOMPLETE The figures that show the pictorial CSM for ecological and human receptors are general. For example, they do not clearly depict the relationships between receptors with mine site infrastructure. Furthermore, ecological pathways between all sources of COPCs and ROC groups are not depicted (e.g. consumption of aquatic organisms by mammals or birds are not depicted). Also, drainage directions and other pathways are not clearly depicted in the diagram (the arrows do not depict pathways specifically). A comprehensive CSM for each of the mine sources would support the problem formulation and can be easily revisited as conditions and/or assumptions change to ensure that all sources-pathways-ROCs have been considered. The list of potential ecological ROCs provided in Table 2.1-1 does not match the list of ROCs depicted as part of the pictorial CSM (Figure 2.5-1). Some of the receptors shown on the pictorial CSM drawing have complete exposure pathways, but are not included in Table 2.1-1. In addition, the Artic Hare, which is a surrogate for small mammalian herbivores, is omitted in Section 2.1.1. This ROC would have a high level of exposure due to their small home range. Furthermore, the Artic Hare is used as a country food in the human health risk assessment under the assumption that: "consumption of Arctic hare would likely represent the highest exposure to metals in small mammals harvested from the country foods study area" but it not considered as an ecological receptors.	Does DDMI plan to add detail to the CSM to clearly reflect exposure pathways? Can DDMI explain the discrepancies between the list of ROCs and Figure 2.5-1?	The Phase I Report will be updated to include a full description of all potential exposure pathways to COPCs for human and ecological ROCs, whether the pathway is complete or incomplete. Figure 2.5-1 of the Phase I Report will also be updated with the changes. Additional detail about the updates to the Phase I and II Reports, as requested, can be found in responses to comment ID's: EMAB-8, EMAB-9, EMAB-10, EMAB-11, EMAB-12, EMAB-14, EMAB-20, EMAB-21, EMAB-41, EMAB-45, EMAB-50, EMAB-51, EMAB-59, EMAB-68, WLWB-5, and WLWB-8.		Phase I Report: Sections 2.2 (p. 2-7 to 2-11) and 2.5 (p. 2-33): Figures 2.5-1 (p. 2-34) and 2.5-2 (p. 2-35).	An updated CSM as requested by the reviewer would increase transparency of the approach taken and should be considered by Diavik.
WLWB-5	WLWB: Anneli Jokela	Phase I Report: Section 2.2.2 Potential Exposure pathways for Human Health	THE PATHWAYS THAT WERE CONSIDERED FOR THE DEVELOPMENT OF SITE SPECIFIC RISK-BASED CRITERIA FOR HUMAN HEALTH APPEAR TO BE INCOMPLETE. The pathway of "Inhalation of particulates" have been excluded from the COPC screening. The exclusion of the "inhalation of particulates" pathway will change the results of the calculations (Appendix A) and does not conform to Health Canada requirements. The pathway of "Dermal contact" with sediment has been excluded from the screening report. The exclusion of the sediment demal contact pathway at the North Inlet sub-area and only the inclusion of drinking water pathway in this location requires further clarification. If there is potential for human consumption of drinking water at this location, why is there not the potential for dermal exposure? The significance of the exclusion was not addressed in the uncertainty section or discussed in relation to Health Canada guidance for derivation of SSRBSC.	(1) Has DDMI considered the Health Canada requirements concerning the "inhalation of particulates"? Can DDMI provide rationale for why this pathway was excluded given the Health Canada requirements? (2) Can DDMI further explain why the pathway of dermal contact with sediment at the North Inlet sub-area has been excluded?	(1) Closure criteria for total suspended particles (TSP) have been developed for the Project. It is expected that the Project will meet the closure criteria for TSP and that dust levels during the Closure phase will be minimal. Therefore, the inhalation pathway was excluded for ROCs. (2) Wading or recreational activities would likely only expose the feet of an individual to sediment, thus there would be a very small surface area of the body exposed. Furthermore, it is unlikely that an individual would spend long periods of time standing or wading in sediment as Arctic lakes have cold temperatures and the sediment would most likely be washed off with the lake water upon exit. Therefore the exposure time of the feet to sediment would be very short. Since exposure to sediment involves a small dermal surface area and a short period of time, the potential risk to human health is negligible. Furthermore, Health Canada (2010) does not provide guidance on the assessment of dermal contact with sediment; therefore, human exposure to sediment was not considered in the derivation of SSRBCCs.	Health Canada. 2010. *Federal Contaminated Site Risk Assessment in Canada, Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA)* . Version 2.0. Revised 2012. Contaminated Sites Division, Safe Environments Directorate: Ottawa, ON.	Phase I Report: Section 2.2.2 (p. 2-8 to 2-11).	Arcadis has made similar comments and they were not adequately addressed.
WLWB-6	WLWB: Anneli Jokela	Phase I Report: Section 2.3; Potential Project-related sources of contaminants.	NOT ALL PROJECT-RELATED SOURCES APPEAR TO HAVE BEEN INCLUDED Construction and operation plans for A21 include the development of the A21 Waste Rock Storage Area. Should the A21 WRSA be added to the list? Are environmental quality concerns related to A21 WRSA anticipated to be any different from those arising from the existing list?	(1) Comment on whether the A21 WRSA should be added to the list of Project-related sources of contaminants and exposure media. (2) Is DDMI aware of any contaminants associated with the A21 WRSA that have not been identified in other pathways?	(1) The potential for contaminants from the South Country Rock Pile (A21) are effectively addressed through the Type I rock exposure already included. A21 waste rock is not potentially acid generating so it is not expected to be a source. (2) DDMI is not aware of any contaminants associated with the A21 WRSA that have not been identified in other pathways.		Phase I Report: Section 2.3 (p. 2-11 to 2-13). Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 17).	Comment does not affect previous comments made.
WLWB-7	WLWB: Anneli Jokela	Phase I Report: Section 2.4. COPCs screening and Appendices A to D.	ENVIRONMENTAL DATA, PREDICTED CONCENTRATION AND LOCATIONS OF SAMPLES THAT SUPPORT THE DEVELOPMENT OF THE SITE SPECIFIC RISK BASED CRITERIA ARE NOT INCLUDED. The report does not include data sources and only limited statistical summaries are presented for the screening of COPCs (e.g. mean, max, and/or 95th percentile; the sample size is not always provided). Also, the report does not provide drawings showing all sampling locations, including all background locations.	Will DDMI be providing data sources and drawings showing sampling locations when presenting the closure criteria in ICRP 4?	First it is important to note the information referenced above was only used to screen the contaminants where site-specific risk-based criteria would be advanced at this time. This information was not used to estimate post-closure exposure concentrations or evaluate associated risks. The information was also not used to select total COPC for closure. To clarify this, we will add the relevant CCME (or equivalent) criteria for parameters that do not have SSRBCC. Regardless, we understand that reviewers would like more information about the data used to determine which parameters would have SSRBCC. These will be provided in a revised document that will be included in support of ICRP V4. The purpose of screening for COPCs using maximum concentrations is to ensure that no parameters are excluded from a risk assessment when they should be considered. However, for the purposes of deriving SSRBCCs, if a parameter was not screened into the assessment during the COPC selection process the closure criteria will be the CCME (2015) environmental quality guidelines. This would result in a conservative benchmark for use as closure criteria in the event that parameters were missed in the COPC selection process through the use of a statistic other than the maximum concentration.	CCME. 2015. Canadian Environmental Quality Guidelines - Summary Table. Canadian Council of Ministers of the Environment. http://st-ts.ccme.ca/en/index.html (accessed August 2015).	Phase I Report: Sections 2.4.2 (p. 2-14 to 2-15), and 2.4.3.2 (p. 2-17 to 2-23). Revised document included in support of ICRP V4.	Comment is not addressed and no additional information appears to be forthcoming. Defaulting to the CCME EQG will reduce the uncertainty associated with the approach taken.
WLWB-8	WLWB: Anneli Jokela	Phase I Report: Section 2.4.3.1 Soil COPCs screening for Ecological ROCs	IT IS UNCLEAR IF COPCS IN THE SOIL FOR THE PROTECTION OF TERRESTRIAL INVERTEBRATES AND TERRESTRIAL PLANTS WERE CONSIDERED IN DEVELOPING SITE SPECIFIC RISK BASED CLOSURE CRITERIA (SSRBCC) FOR ECOLOGICAL RECEPTORS. Table 2.1-3 presents final COPCs in soil for wildlife ROCs. A discussion of COPCs in soil for terrestrial invertebrates and terrestrial plants seems to be missing. Both these receptors were identified as having complete exposure pathways with soil COPCs. Determining COPCs separately for terrestrial invertebrates, plants and terrestrial wildlife (birds and mammals) would increase the level of certainty for ecological soil COPC selection.	Will DDMI be including COPC screening in soil for terrestrial invertebrates and plants in the criteria proposed in ICRP4? If not, please provide a rationale.	The CCME (2015) soil quality guidelines were used to screen for COPCs in soil and the guidelines are applicable to wildlife and terrestrial plants and invertebrates. Therefore, COPCs specific to terrestrial plants and invertebrates were captured with the use of the CCME guidelines. SSRBCCs were developed for terrestrial plants and invertebrates. Table 1.1-1 of the Phase II report indicates that terrestrial plants and invertebrates were considered as applicable ROCs for COPCs in soil. The equations used in the calculation of SSRBCCs for terrestrial plants and invertebrates for COPCs in soil are provided in Table 1.1-2 of the Phase II report. The TRVs for terrestrial plants and invertebrates are provided in Table 2-2 of the Phase II report. As noted in Table 1.2-1 of the Phase II report, the soil SSRBCC for terrestrial plants and invertebrates are equivalent to the TRVs for those species.	CCME. 2015. Canadian Environmental Quality Guidelines - Summary Table. Canadian Council of Ministers of the Environment. http://st-ts.ccme.ca/en/index.html (accessed August 2015).	Phase I Report: Section 2.4.3.1 (p. 2-15 to 2-17). Phase II Report: Tables 1.1-1 (p. 1-2), 1.1-2 (p. 1-3), and 2.3-1 (p. 2-6).	Approach will be reviewed for appropriateness and if concerns will be captured in Table 1 of the Arcadis report.
WLWB-9	WLWB: Anneli Jokela	Phase I Report: Section 2.4 Selection of Contaminants of Potential Concern (for Soil)	INCONSISTENT USE OF STATISTICS WHEN SELECTING COPCS The general methodology of selecting the concentration of the COPC in soil is unclear in terms of using the 75th percentile (the 95th percentile was used for other media). Common practice is to use the maximum, 95th percentile or 95 upper confidence limit of the mean (95UCLM). This method would potentially screen out COPCs that would otherwise be included for completing SSRBCC. The rationale for selecting the 75th percentile to screen soil COPC rather than the 95th percentile (as done with other media) was not provided. In addition, for ecological receptors, sessile organisms such as plants and invertebrates can be exposed to maximum concentrations.	Provide rationale for why the 75th percentile was used, rather than the 95th percentile, for soil COPCs.	The purpose of screening for COPCs using maximum concentrations is to ensure that no parameters are excluded from a risk assessment when they should be considered. However, for the purposes of deriving SSRBCCs, if a parameter was not screened into the assessment during the COPC selection process the closure criteria will be the CCME (2015) environmental quality guidelines. This would result in a conservative benchmark for use as closure criteria in the event that parameters were missed in the COPC selection process through the use of a statistic other than the maximum concentration.	CCME. 2015. Canadian Environmental Quality Guidelines - Summary Table. Canadian Council of Ministers of the Environment. http://st-ts.ccme.ca/en/index.html (accessed August 2015).	Phase I Report: Section 2.4.2 (p. 2-14 to 2-17).	Arcadis has made similar comments and they were not adequately addressed, however, defaulting to the CCME EQG for parameters without SSRBCC will reduce the concern associated with the approach used to identify COPCs.
WLWB-10	WLWB: Anneli Jokela	Phase I Report: Section 2.4 Selection of Contaminants of Potential Concern; Section 2.4.3.3 Fish Tissue COPCs screening for Ecological ROCs; Section 2.4.3.4 Sediment COPCs screening for Ecological ROCs	COPC SCREENING OF FISH TISSUE AND SEDIMENT IS NOT COMPREHENSIVE OF ALL BIOACCUMUATIVE COPCS There is no discussion in regards to bioaccumulation potential as part of the selection of COPCs in Section 2.4. Also, the COPC screening for fish tissue is limited to two metals (mercury and selenium). The FCSAP for Ecological Risk Assessment Guidance (Environment Canada 2012) indicates that guidelines from other jurisdictions can be used in the absence of CCME guidelines. In the case where guidelines for the 'protection of wildlife consuming aquatic biota' are available the bioaccumulation potential could be assessed. Furthermore, the bioaccumulation potential of the sediment COPCs could be considered to select sediment COPCs for the protection of wildlife receptors for the food ingestion pathway (e.g. aquatic-dependent birds consuming benthic invertebrates). The CCME sediment quality guidelines that were used to screen COPCs for ecological receptors did not account for bioaccumulation.	Please provide a rationale for why DDMI did not assess the potential for bioaccumulation prior to screening out COPCs, and why DDMI did not include COPCs with bioaccumulation potential in the development of SSRBSC.	The protocol for deriving SSRBCCs was adopted from CCME guidance documents. The CCME (2007) guidance document A Protocol for the Derivation of Water Quality Guidelines for the Protection of Aquatic Life, states that bioaccumulation is not considered to be part of the protocol for the derivation of water quality guidelines. This is because the protocol involves the concentration of the parameter in the water column and the toxic effects to aquatic organisms that result from direct exposure, whereas bioaccumulation does not necessarily cause toxicity and instead depends on bioreactivity within an organism (CCME 2007). Bioaccumulation in organisms depends on many factors and with metals tends to only occur with methylmercury, organo-selenium compounds, and possibly a few other organo-metallics (CCME 2007). The CCME (2007) states that it is more appropriate to take bioaccumulation and biomagnification into account with tissue residue guidelines. Therefore, SSRBCCs for fish tissue were also developed to account for COPCs that may bioaccumulate in organisms.	CCME. 2007. *A Protocol for the Derivation of Water Quality Guidelines for the Protection of Aquatic Life 2007* . In: Canadian Environmental Quality Guidelines, 1999. Canadian Council of Ministers of the Environment: Winnipeg, MB.	Phase I Report: Section 2.2.1 (p. 2-8).	The reviewers comment was not adequately addressed and mirrors concerns in previous comments made by EMAB.
WLWB-11	WLWB: Anneli Jokela	Phase I Report: Section 2.4 Selection of Contaminants of Potential Concern (2.4.3.2. water)	DIFFERENCE IN SCREENING BENCHMARKS FOR COPCs IN SURFACE WATER Diavik-specific benchmarks and site-specific water quality guidelines for the protection of aquatic life and drinking water are included in the COPC screening section. An explanation of the difference between the Diavik-specific benchmarks and SSWQOs was not provided. If SSWQOs are not Diavik-specific benchmarks, how were these derived? Also, there appears to be differences between the Diavik benchmarks used in the SSRBCC Report and the Effects Benchmarks used in the AEMP.	(1) Please explain the difference, if any, between Diavik benchmarks and SSWQOs. (2) Please provide an explantion of, and rationale for, differences between the Diavik benchmarks used in this report and the AEMP Effects Benchmarks.	The intent was to utilize DDMI-specific benchmarks already established, in the screening of COPC for SSRBCC. A more complete explanation and/or reference to the derivation of the Diavik-specific benchmarks will be included in a revised document that will be provided in support of ICRP V4. Any deviation from the Diavik-specific benchmarks will be noted and explained.		Phase I Report: Section 2.4, Table 2.4-3 (p. 2-19 to 2-21), Section 2.4.3.2 (p. 2-17 to 2-22), Section 2.4.5.2 (p. 2-29 to 2-31), Table 2.4-12 (p. 2-30). Revised document included in support of ICRP V4.	The additional information requested regarding the Diavik Benchmarks and the AEMP could not be found. For transparency, the approach used in the derivation of these guidelines should be provided so the basis can be reviewed to determine the adequacy of using these guidelines as Closure Criteria.

ID	Reviewer	Topic	Comment	Recommendation	Proponent Response	References/Link to memo	Location in reports	
WLWB-12	WLWB: Anneli Jokela	Phase I Report: Section 2.4 Selection of Contaminants of Potential Concern (2.4.3.2. water)	A RATIONALE BEHIND THE SELECTION OF SCREENING BENCHMARKS FOR COPCs IN SURFACE WATER IS NOT INCLUDED IN THE REPORT A discussion of how the Diavik-specific benchmarks and guidelines relate to the protection goals the criteria were based on is not included in the report. This is necessary to ensure that the level of protection offered by Diavik-specific benchmarks and site-specific water quality guidelines are the same as what has been used for development of the SSRBCC . In addition, the integration of data for the screening for 'open water' and 'ice cover water' has not been discussed in the development of SSRBCC. It is unclear how this distinction will be used in the SSRBCC development.	(1) Provide a discussion and rationale for how the Diavik-specific benchmarks and site-specific water quality guidelines for the protection of aquatic life and drinking water are appropriate screening criteria for screening COPCs in the context of protection goals used in the SSRBCC. (2) Discuss how data from the open water and ice-covered season will be used/intergrated.	The intent was to utilize DDMI-specific benchmarks already established, in the screening of COPC for SSRBCC. A more complete explanation and/or reference to the derivation of the Diavik-specific benchmarks will be included in a revised document that will be provided in support of ICRP V4. Any deviation from the Diavik-specific benchmarks will be noted and explained. Water quality parameters in lakes change during the seasons, thus water quality during the ice covered and open water seasons was screened for COPCs. This was done to ensure that all COPCs were included. The seasonal consideration was only important for COPC selection; it was not used in the SSRBCC derivation process.		Phase I Report: Section 2.4, Table 2.4-3 (p. 2-19 to 2-21), Section 2.4.3.2 (p. 2-17 to 2-22), Section 2.4.5.2 (p. 2-29 to 2-31), Table 2.4-12 (p. 2-30). Revised document included in support of ICRP V4.	The reviewers comment was not adequately addressed and mirrors concerns in previous comments made by EMAB.
WLWB-13	WLWB: Anneli Jokela	Phase I Report: Section 2.4.3.2 Water COPCs screening, and Tables B-1, B-2, B-3 and B-4.	INCLUSION OF A COMPLETE SUITE OF ENVIRONMENTAL PARAMETERS FOR SCREENING PURPOSES The predicted Pit Lake Water Quality, that is summarized in Tables B-1 and B-2 and used to screen COPCs for aquatic life and Tables B-3 and B-4 used to screen COPCs for wildlife, do not include a complete suite of environmental parameters in support of CCME guidelines.	Provide rationale for not using the complete suite of environmental parameters that are part of CCME guidelines.	Predicted pit water quality was available for only a few parameters at this time. However, parameters that were not screened into the assessment during the COPC screening process will default to the CCME (2015) environmental quality guidelines, which would be adequately conservative for use as closure criteria.		Phase I Report: Section 3.4 (p. 3-2 to 3-3).	The methodology used to select COPCs is flawed, however defaulting to the CCME EQG for parameters not identifed as COPCs will address the uncertainty in the majority of cases.
WLWB-14	WLWB: Anneli Jokela	Phase II Report: Table 1-2-1, Section 1.3.1, equations in Appendix A and risk based criteria presented in Appendices H and J. - Ecological Receptors	THE USE OF THE EXPOSURE FACTOR: TIME SPENT ON SITE (ET) IN THE DERIVATION OF SITE SPECIFIC RISK BASED CRITERIA (SSRBCC) FOR ECOLOGICAL RECEPTORS IS UNCLEAR The equations for wildlife in Table 1.2-1 do not include time spent on site (ET); however, time spent on-site is considered in the text, in Section 1.3.1 . The risk-based criteria for wildlife seems to have been calculated based on the assumption that the ROC would spend all year on site (ET = 1). For example the SSRBCCwater for the caribou is 8.0 mg/L. If the ET discussed in section 1.3.1 is used (0.164; 2 months per year), the SSRBCCwater would be 49 mg/L. The example of work calculation presented in Appendix A for the Caribou SSRBCCwater shows an ET of 0.164 as part of the equation but the result reflect an ET of 1. Clarification is required.	When calculating risk-based target, can DDMI clarify whether the time spent on-site for the wildlife ROCs was defaulted to 1.0 or adjusted when time spent on site was assumed to be less than a year? If ET less than 1.0 were used, were the risk-based criteria reviewed to ensure they were added to the equations?	The time spent on-site for the wildlife ROCs was defaulted to 1.0, thus the text in Section 1.3.1 of the Phase II Report will be updated to remove consideration for exposure time. Assuming that ROCs spent all of their time on-site is a conservative measure that will ensure ROCs are not exposed to potentially harmful concentrations of COPCs.		Phase II Report: Section 1.3.1 (p. 1-5).	Arcadis made a similar comment and was addressed above.
WLWB-15	WLWB: Anneli Jokela	Phase II Report: Section 1.3.1. Wildlife-specific parameters	THE USE OF THE BODY WEIGHT AND EXPOSURE TIME FACTORS IN THE DERIVATION OF SITE SPECIFIC RISK BASED CRITERIA (SSRBCC) FOR ECOLOGICAL RECEPTORS IS UNCLEAR The upper range value of either male or female was used as the body weight exposure factor (BW). CCME (2006) recommends using the mean value for the body weight exposure factor. Furthermore, there is a discrepancy between exposure time factor (ET) stated in the text and used in the equations and verified in the worked calculations.	(1) Please provide rationale for using a different body weight exposure factor than that recommended by CCME. (2) Please explain the discrepancy between the exposure time factor stated in the text and thosed used in the equations.	Refer to the response in the attached document. Results will be incorporated into the next phase of the report. The mammalian and avian SSRBCCs are lower when mean weights are used; however, the only final SSRBCC for the Project that changed was the $SSRBCC_{water}$ for cobalt, which changed from 8.28 to 7.78 mg/L.	**See attachment**	Phase II Report: Section 1.3.1 (p. 1-5), and Table 1.3-1 (p. 1-10 to 1-11). Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 46-41).	Arcadis will confirm the suggested changes were made in the updated Phase I and Phase II reports.
WLWB-16	WLWB: Anneli Jokela	Phase II Report: Section 2. TRVs	THE LEVEL OF EFFECTS ASSOCIATED WITH THE TOXICITY REFERENCE VALUES SELECTED FOR THE GROUPS OF ECOLOGICAL RECEPTORS IS NOT SPECIFIED The report does not specify effects levels that are acceptable for ecological receptors that were used in the derivation fo the SSRBCCs. For example, Environment Canada (2012) recommends 20% effect level for non-listed species.	Has DDMI established or considered protection levels for the ecological ROCs? If not, can DDMI provide rationale for why these would not be necessary?	Refer to the response in the attached document. Results will be incorporated into the next version of the Phase II Report.	**See attachment**	Phase I Report: Section 2.1 (p. 2-1 to 2-7), and Table 2.1-1 (p. 2-2 to 2-5). Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 42 to 47).	The level of protection afforded to aquatic VECS is not supported and will not protect the aquatic environment. The level of protection specified for aquatic ROCs will not provide suitable protection for aquatic receptors to meet the closure objectives of the mine. Setting a SSRBCC at an EC50 (where 50% of the test species are affected) does not confer adequate protection, especially given the differences between species susceptibility to impacts. Further to this issue, Diavik has chosen to include toxicity information of only species observed in the vicinity of the Site, and excluding all other toxicity information for species based on absence of identification. Consideration that standard toxicity testing methodology relies on standardized test species was not given and that the laboratory test species are surrogates for VECs was not considered. The exclusion of toxicity data as completed in the Phase I and Phase II reports is not supported.
WLWB-17	WLWB: Anneli Jokela	Phase II Report: Section 1.3.2, equations in Appendix A - Human Health	THE EXPOSURE TIME FACTOR USED FOR DERIVING SITE SPECIFIC RISK BASED CRITERIA (SSRBCC) FOR HUMAN HEALTH DOES NOT FOLLOW HEALTH CANADA GUIDANCE The exposure time factor for the human health risk assessment is based on information from a nearby mining project, the Jay Project. However, short term exposure guidance from Health Canada is to use an exposure time factor value of 1 or 52 weeks out of 52 weeks exposure. The SSRBCC equations use a factor of 12 weeks out of 52 weeks. To be consistent with Health Canada guidance, for short term exposure, an exposure factor of 1 would be used.	Can DDMI provide rationale for using a different exposure factor for human health than that recommended by Health Canada?	The Diavik Project is in a remote area of the Northwest Territories. The closest communities to the Project, Wekweeti and Gameti to the west the Project and Fort Reliance and Lutsel K'e to the south (Golder Associates Ltd. 2015), are over 150 km away. It is unlikely that people would be in the area year round; therefore, a conservative continuous exposure period of three months (the entire hunting season) was considered in the derivation of SSRBCCs, as described in Section 1.3.2 of the Phase II Report. 3 months is a conservative exposure period for the remote location and realisticallyamortizing this conservative exposure duration over the year may account for small portionf of foods eaten over the course of the year from limited hunting excursions onsite. The TRVs used in the SSRBCC derivation are protective of sensitive populations and applicable to chronic exposures.	Golder Associates Ltd. 2015. Traditional Land Use and Traditional Knowledge Baseline Report for the Jay Project. http://reviewboard.ca/upload/project_document/EA1314-01_17_Annex_XVII_Traditional_Land_Use_and_Traditional_Knowledge_Baseline.PDF (accessed September 2015).	Phase II Report: Section 1.3.2 (p. 1-9).	The approach used does not address the amortization comment and could result in SSRBCC that are not protective of short term intense exposures. The probability of being exposed to food over a longer period of time is captured in the proportion of the diet impacted by the Site and should not be captured in the amortization for short term exposure to direct contact. The comment has not been adequately addressed and could influence the SSRBCC calculated.
WLWB-18	WLWB: Anneli Jokela	Phase II Report: Appendix A - Human Health; Section 1.2.3	VERIFICATION OF ANTIMONY IN WATER CALCULATION PRESENTED IN THE REPORT The worked example of calculation for SSRBCC in water for antimony could not be verified as presented.	Clarify the equation and inputs for the worked calculation.	Refer to the response in the attached document. An error was noted in the calculation of $SSRBCC_{water}$ for humans – the ET_1 exposure time factor had been left out of the calculation. Inserting ET_1 resulted in an increase in the $SSRBCC_{water}$ values for adults and toddlers. The only final $SSRBCC_{water}$ for the Project that changed was that for antimony (from 0.00662 to 0.0286 mg/L). The updated results will be incorporated into the next version of the Phase II Report.	**See attachment**	Phase II Report: Section 3.2 (p. 3-2), and Table 3.2-1 (p. 3-3); and Appendix K (p. 1 of 1). Detailed explanation in memo to Ms. Violet Camsell-Blondin on June 2016 (p. 49 to 51).	Arcadis confirmed results carried into Phase II report

ATTACHMENT 2: CRP V4.0 DRAFT COMMENTS

GENERAL INSTRUCTIONS FOR EXCEL TEMPLATE:
1. Do not leave blank rows above or between comments.
2. Do not modify or delete the instructions or the column headings (i.e. the grey areas).
3. Each comment must have an associated topic and recommendation.
4. All formatting (i.e. bullets) will be lost when this file is uploaded to the Online Comment Table.
5. If necessary, adjust the cell width and height in order to view all text.
6. Cutting and pasting comments from WORD documents cannot include hard returns (spaces between paragraphs).
7. If you would like to create paragraphs within a single cell, please use a proper carriage return (ALT & ENTER).

TOPIC	COMMENT	RECOMMENDATION
Be as specific as you think is appropriate; for example a section or page of the document, a recommendation #, general comment, etc.	*Comments should contain all the information needed for the proponent and the Board to understand the rationale for the accompanying recommendation.*	*Recommendations can be for the proponent or for the Board. Recommendations should be as specific as possible, relating the issues raised in the "comment" column to an action that you believe is necessary.*
CRP V4.0 Closure Criteria - General Comment	There are various specfic comments made below where Arcadis was unable to complete a thorough review of the risk-based Closure Criteria because of the lack of transparency of how these criteria were derived.	These sections need to be reviewed once additional clarity/information is provided.
CRP V4.0 Appendix V Table V-7 and NCRP-WRSA Closure Plan	A number of the proposed surface runoff/seepage Closure Criteria for the Protection of Aquatic Life are inconsistent with those proposed in the NCRP-WRSA Closure Plan (DDMI, 2017). Rationale for the differences should be provided as they should be providing the same level of protection. Examples include, but are not limited to silver, copper, nickel, zinc	Closure Criteria should be consistent for the different management areas if they are protecting the same receptors and the Closure Objectives are the same or similar (i.e., safe water for aquatic life).
CRP V4.0 Appendix V Table V-7 and NCRP-WRSA Closure Plan	Closure Critierion for unionized ammonia was included in Table V-7 but not in the Closure Criteria for NCRP-WRSA. Closure Criterion for ammonia was not included in Table V-7, but was included in the NCRP-WRSA Table V1. It is not clear how the parameters requiring Closure Criteria were selected and why they differ between the two reports.	The process used to identify parameters requiring Closure Criteria should be clearly provided. Concerns regarding COC identification were previously made in the Phase I Report. Diavik has indicated that for any parameters not identified as COPCs that default to CCME Water Quality Guidelines (WQG) protective of Aquatic Life will occur. Diavik should indicate the approach for mine-related parameters that are without CCME WQG
CRP V4.0 Appendix V Table V-7 and NCRP-WRSA Closure Plan	The Closure Criteria proposed for nitrite and thallium in Table V-7 of the CRP V4 and Table V1 of the NCRP-WRSA are different. It appears that this is based on rounding to significant figures. Some of the AEMP's are also different than the CCME WQG that they are presumably adopted from, this too appears to be a rounding issue (e.g., cadmium).	A consistent approach should be used for addressing significant figures in the derivation of the Closure Criteria for all management areas.

TOPIC	COMMENT	RECOMMENDATION
CRP V4.0 Appendix V Table V-7	The back calculated criteria that are proposed for Closure Criteria are an order of magnitude (or more) greater than the concentrations protective of aquatic life. Given that these elevated concentrations are proposed to be applicable for a 1 km distance from the shore of the island, adverse effects to aquatic receptors would be expected, thus making DDMI's closure objectives unattainable with these criteria.	Closure Criteria protective of aquatic life need to be revised.
CRP V4.0 Appendix V Table V-7 - MMER	DDMI has proposed the MMER as Closure Criteria for some parameters including nickel and unionized ammonia. The MMER are not designed to be protective of the aquatic environment, but are instead regulatory discharge limits that a point source effluent must meet and demonstrate the absence of acute toxicity at the discharge point. The Environnmental Effects Monitoring (EEM) program together with chronic toxicity testing is used to support the MMER and to demonstrate the absence of adverse effects.	Closure Criteria should not be based on the MMER.
CRP V4.0 Appendix V Table V-7 -Back Calculation Approach	This approach is the same approach used for the NCRP-WRSA. Therefore comments pertaining to the Effects Magnitude, Mixing Zone and Dilution Factor previously made in the review of the NCRP-WRSA applies here. Briefly, a 1km dilution zone, the dilution factor applied and the Effects Magnitude do not appear to be protective of the Aquatic Environment.	The approach and assumptions used to back-calculate Closure Criteria protective of aquatic life needs to be amended. As it stands, they are non-protective of the aquatic environment and would not enable DDMI to meet their closure objectives.
ICRP V4.0 Appendix V Table A-Reference Condition	The reference condition concentrations tabulated in Table A indicate that they are taken from the DDMI 2015 report. As indicated on page 37-28 of the CRP V4.0 report,water quality parameters have been increasing gradually with time and indicators of effluent suggest that effluent has reached the far-field areas of Lac de Gras.	DDMI should confirm that the appropriate background water quality parameters are used in the derivation of the Closure Criteria. The Closure Criteria should be set at a concentration that will not result in adverse effects when considering the input from the mine in addition to current conditions of Lac De Gras.
CRP V4.0 Appendix V Table V-7 -Achievability	DDMI has compared the back-calculated Closure Criteria (which, in Arcadis' opinion are not protective of the aquatic environment given the method of calculating through the application of a mixing zone, dilution factor, effects concentration etc) with predicted modelled results and indicated that adjustment based on being able to achieve the Closure Criteria is appropriate (Achievability). As a result, the Closure Criteria proposed for silver and copper have been increased to be able to be met by DDMI's closure plans. This is not acceptable and will result in DDMI not achieving their objectives of protection of aquatic life.	Closure Criteria should be set based on no (or acceptable) impacts to the aquatic environment, not whether DDMI is predicting what will be leaching from the waste or closure activities. This modification of the Closure Criteria based on achievability should be removed from consideration in the derivation of the Closure Criteria protective of aquatic life.

TOPIC	COMMENT	RECOMMENDATION
CRP V4.0 Appendix V Table V-7 -Nitrogen compounds	Nitrogen compounds are associated with mine activity and are toxic to aquatic organisms in certain forms. Therefore, the Closure Criteria must be set based on the protection of aquatic life and not on achievability of leaching potential or the MMER.	Closure Criteria related to nitrogen compounds need to be revised.
CRP V4.0 Appendix V Table A	Please confirm the AEMP for Silver.	As the AEMP is not consistent with the CCME Water Quality Guidelines for the Protection of Aquatic Life (CCME WQGAL) rationale should be provided for the basis of this number.
CRP V4.0 Appendix V Table A	It is unclear the assumptions used for the setting of the AEMP for parameters that are influenced by hardness, temperature and/or pH. Examples include, but are not limited to aluminum, copper, lead and nickel.	A footnote should be added to Table A to clarify what assumptions were made or what hardness, pH etc. were assumed in the derivation of the Closure Criteria. This is important especially if conditions in the Lac de Gras or the receiving waters may change with time.
CRP V4.0 Table 3.1-1	It is unclear why the SSRBCCS for aluminum in soil is shown as not available when in Appendix I Closure Criteria have been developed, e.g., for mammals.	Clarification should be provided.
CRP V4.0 Table V-8	Please update references to Appendix K instead of Appendix J	Change references to Appendix J to Appendix K
CRP V4.0 Table V-8 and Appendix K Water SSRBCC	None of the SSRBCC for water in Appendix K correspond to the SSRBCC for water provided in Table V-8 of the CRP V4.0. For some parameters (arsenic, chromium) the SSRBCC for drinking water has defaulted to the Health Canada Drinking water guidelines as presented in Table V8, this approach is acceptable. However, for others, such as mercury, selenium and sulphate, it is not clear which of the SSRBCC Diavik intends to rely upon. As a result comments regarding the applicability of the SSRBCC protective of human health cannot be made at this time. Please note that molybendum has a SSRBCC derived in Appendix K of the Phase II Report, but does not have a SSRBCC specified in Table V8. Please clarify.	Ensure that the Phase II SSRBCC for protection of human health is consistent with the SSRBCC provided in the CRP V4.0 Appendix V.
CRP V4.0 Table V-8 and Appendix K Water SSRBCC of the Phase II Report (Appendix X-8.2)	Table 3.2-1 of the Phase II Report (Appendix X-8.2) indicates that the SSRBCC for antimony is based on the protection of the toddler, however the SSRBCC in Table V8 indicates that the value protective of the toddler is 0.00662 mg/L not 0.0236 mg/L as indicated in Table 3.2-1. Please clarify.	Please update the tables to be consistent.

TOPIC	COMMENT	RECOMMENDATION
CRP V4.0 Table V-9 and Appendix X8.2-Appendix I Water SSRBCC for birds.	Table V9 refers to Appendix I of the Phase II report for the derivation of the SSRBCC protective of birds exposed to water. Please update references in the CRP V4.0 to Appendix J.	Update references.
CRP V4.0 Table V-9 and Appendix X8.2-Appendix J Water SSRBCC for birds.	The water Closure Critieria in Table V9 of the CRP V4.0 do not correspond to the numbers provided in Appendix J SSRBCC for Birds (Water) for any of the bird receptors or COPC combinations. It is not clear which values Diavik intend to use as Closure Criteria, therefore detailed comments on the suitablility of the comments cannot be made at this time.	Please ensure that the SSRBCC for water protective of birds is consistent between the Table V9 and Appendix X-8-2 Appendix J.
CRP V4.0 Table V-9 and Appendix X8.2-Appendix J Water SSRBCC for birds.	For Mine-related parameters that were not identified as COPCs through Diavik's screening process, it is not clear what will be used as Closure Criteria protective of birds as the CCME EQGs for aquatic life do not consider higher trophic level protection. Clarification of the approach to be used must be provided.	A description must be provided of how closure criteria will be set for Site related parameters in water that were not identified as COPCs because of the screening process used, and that are without CCME EQGs.
CRP V4.0 Table V10 and Appendix X8.2-Appendix I Water SSRBCC for mammals.	The ROCs provided in Table V10 do not correspond with the ROCs provided in Appendix I of the Phase II Report found in Appendix X-8-2 of the CRP V4.0.	Please update the tables to be consistent.
CRP V4.0 Table V10 and Appendix X8.2-Appendix I Water SSRBCC for mammals.	The SSRBCC for grizzly bear found in Appendix I of the Phase II Report are not consistent with the SSRBCC found in Table V10 of the CRP V4.0. It is not clear which ones Diavik intends to submit as the SSRBCC. In addition, the SSRBCC for fox and vole are slightly different between the two tables, likely a rounding issue. Please clarify.	Please update the tables to be consistent.
CRP V4.0 Table V10 and Appendix X8.2-Appendix I Water SSRBCC for mammals.	What is the proposed approach for Site related parameters that were not identified as COPCs because of the screening approach used? Defaulting to the CCME EQGs for the protection of aquatic life as Closure Criteria will be non-protective of water exposure to mammals and values protective of livestock watering may not be derived?	Please provide an approach for COPCs not identified.
CRP V4.0 Table V11 and Table 3.1-1 Appendix X.8-2	Aluminum in soil was considered as a COPC in Appendix X.8-2 but **not** in Table V11.	Please ensure consistent approach is taken.

TOPIC	COMMENT	RECOMMENDATION
CRP V4.0 Table V12, and Table 3.3-1 and Appendix J of the Phase II Report (Appendix X-8.2)	The SSRBCC proposed in Table 3.3-1 are based on the CCME interim sediment guidelines protective of aquatic life. The sediment quality guidelines are designed to be protective of aquatic receptors (plants, invertebrates and fish) and are not designed to be protective of higher trophic level organisms (such as birds or piscivorous fish). The SSRBCCs proposed in Table 3.3-1 may not be protective of the receptors identified as being protected under the Closure Objectives. For example the SSRBCC proposed for arsenic in sediment of 5.9 mg/kg would be non-protective of sandpiper (SSRBCC in Appendix J calculated to be 0.501 mg/kg); and therefore would not meet the requirements of the Closure Objective. However, Table V12 does not indicate that the SSRBCC for sediment is 5.9 mg/kg as is indicated in Table 3.3-1. It is not clear which SSRBCC Diavik intends to recommend as the final SSRBCC. For transparency, Diavik should provide a summary table that shows all receptors that the SSRBCC should be protective of, the risk-based concentration protective of these receptors and the final SSRBCC chosen for sediment plus a rationale for the basis.	Transparency must be increased and details need to be provided.
CRP V4.0 Phase I Report Table 2.4-12	Daivik used, in this order, project specific drinking water benchmarks and Health Canada drinking water guidelines for the protection of human health through drinking water. No information regarding the derivation or the basis of the project specific drinking water benchmarks was provided. Therefore a review of these could not be made. It is not clear if the critieria used to identify COPCs for drinking water are protective of human health.	The basis/derivation of the project-specific drinking water benchmarks must be provided or the criteria used should be the HC drinking water quality guidelines.
CRP V4.0 Appendix X-8.1 Phase I Report: Table 2.4-12 - Drinking water guideline for lead	Recent science has indicated that a blood lead level of 10 dL/L (which is the basis of the HC DWQG) may be non-protective. HC is in the process of revising the DWQG and until such time has indicated reliance on the TRVs in JHSC, 2010 if evaluation of lead is required.	The reliance on HC DWGS for lead may be non-protective. Consideration of benchmarks derived with more conservative TRVS should be given in accordance with HC recommendations.
CRP V4.0 Appendix X-8.1: Table 2.4-12 - Ethylbenzene	It is not clear, why, when HC provides both a MAC (maximum allowable concentration) and an AO (aesthetic objective), as in the case of ethylbenzene, that the Closure Criterion is set to the AO instead of the health-based criteria.	Clarification of why the AO is relied on as opposed to the MAC when available should be provided.
CRP V4.0 Appendix X-8.1: Table 2.4-12 - Xylenes	Please confirm the aesthetic objective (AO) relied on in this table for xylenes as it is not consistent with the HC DWQG.	Confirm DWQG for xylenes.

TOPIC	COMMENT	RECOMMENDATION
CRP V4.0 Appendix B Table B-9	The Selection of COPCs for drinking water is not defensible, however, if Diavik commits to setting the Closure Criteria for all parameters not identified as COPCs to Health Canada Drinking Water Quality Guidelines, then no additional discussion is required.	Please indicate in the CRP V4.0 that for every Mine related parameter for which a SSRBCC is not derived, the applicable Health Canada Drinking Water Quality guideline will be relied on as the Closure Criterion protective of human health.
CRP V.0 Appendix X-8.1: Section 2.4.5.2 - Water	The text indicates that molybdenum was not considered a COPC for human health, which is not consistent with Table 2.4-13.	Please clarify.
CRP V.0 Appendix X8-1 Appendix B Table B-24	It is not clear why aluminum was not identified as a COPC for DW at the NI as both the mean and the 95% percentile were greater than the guideline and greater than the upper limit of normal. This also applies to Table B-25 for the Kimberlite Containment Area.	Please clarify.
CRP V4.0 Appendix V Table V-8 - Drinking Water Closure Criteria - iron	Iron was identified as a COPC for the NI and for the PKCA, however, drinking water closure criteria were not provided in Table V8.	Please clarify.
CRP V4 Appendix X-8.1 Table 2.1-1	The information provided in this table should indicate that the ROCs are surrogates for all organisms present or potentially present within each guild. For example, the slimy sculpin is a surrogate for all benthivorous fish. The presence of species specific toxicological data is not required for each surrogate, but rather toxicological information from standardized laboratory test species is used to predict toxicity to each ROC and guild it is representing.	Toxicological information was excluded if it wasn't ROC specific. This is not standard practice and will likely result in SSRBCC being non-protective of the receptors.
CRP V4 Appendix X-8.1 Section 2.1.3	It should also be specified which guild the ROCs are representative of. For example, the Lake Trout is representative of all piscivores present in the study area. This applies to fish, mammals and birds.	Additional clarification is required to make it transparent that the SSRBCC is not protecting an individual species, but is protecting a guild (e.g., SSRBCC are not protecting Lake Trout but are derived to be protective of piscivorous fish).
CRP V4 Appendix X-8.1 Section 2.2.1	The text indicates that COPCs could be taken up by the consumption of primary producers. The consumption of animals does not appear to be considered.	Please clarify. Exposure to COPCs that have accumulated in animals can be a major exposure pathway, even if a COPC is not known to biomagnify in the food chain. Exposure through animal and plant consumption (i.e., food chain modeling) must be considered in the derivation of the SSRBCC.

TOPIC	COMMENT	RECOMMENDATION
CRP V4 Appendix X-8.1 Section 2.2.2	Particulate dust inhalation is an exposure pathway that is routinely considered in the derivation of standards/guidelines and is considered additive with the oral and dermal exposure routes. Particulate dust inhalation should be considered in the derivation of SSRBCC that are protective of direct contact to humans from soil.	Add particulate inhalation to the derivation of the SSRBCC protective of direct contact with soil to humans.
CRP V4 Appendix X-8.1 Section 2.2.2	Human exposure to sediment. Human exposure to sediment is a pathway to which Health Canada provides guidance for and they have included low frequency/low duration exposures in their guidance document. Exposure to sediment can occur while fishing and boating and should be considered in the derivation of Closure Criteria.	Consideration of human exposure to sediment should be included in the derivation of the SSRBCC. It is acknowledged that the guidance document is a recent publication by Health Canada.
CRP V4 Appendix X-8.1 Section 2.2.2.1	Please note that bioaccumulation in food is dependent on a number of factors and not just age. The SSRBCC should be derived considering the potential accumulation in food guilds. For example, differentiating between bioaccumulation in a Pike and a Lake Trout is irrelevent for deriving SSRBCC protective of fish consumption.	Remove discussion of Lake Trout and Pike as it suggests that Pike would be fine to eat because they have shorter life spans.
CRP V4 Appendix X-8.1 Section 2.3.3.1 Processed Kimberlite Containment Area	Diavik should indicate that the cover blocking exposure to the Type III rock will be maintained, otherwise consideration of exposure should be given.	Indicate that, although specific maintanence plans have not been developed at this time, Diavik will maintain the cover over the Type III rock preventing direct contact by humans and ecological receptors.
CRP V4 Appendix X-8.1 Section 2.4.1 types of Contaminates Considered in the Assessment	The second paragraph indicates metals are COPCs in soil. The paragraph above indicates hydrocarbons (assuming this includes petroleum hydrocarbons (PHCs) and polycyclic aromatic hydrocarbons (PAHs) were identified as being associated with mine activities. Why were PHCs and PAHs not identified as being considered for soil COPCs?	Metals, PHCs and PAHs should be considered for the derivation of SSRBCC in environmental media (soil, sediment, surface water, seepage water, tissue etc).

TOPIC	COMMENT	RECOMMENDATION
CRP V4 Appendix X-8.1 Section 2.4.2 General Methodology for Selecting Contaminants of Potential Concern	Concerns regarding the approach for COPC identification remain. The approach used is not standard practice and will result in the exclusion of parameters that should be retained as COPCs and have SSRBCC developed. However, since Diavik has committed to using the CCME EQG for all parameters for which SSRBCC have not been derived, the concern is mitigated by this approach for the protection of plants, animals and protection of aquatic life. However, as CCME EQGs do not consider the protection of higher trophic level organisms, the protection of mammals and birds and piscivorous fish has not been accounted for Mine-related parameters that do not have a SSRBCC derived. The approach taken for higher trophic organisms for Site-related parameters that are not identified as COPCs requires revision. It should also be noted that the purpose of identifying COPCs in a risk assessment and for developing site specific standards (i.e., Closure Criteria) is the same and the same premise should apply. COPC selection was not reviewed again as the approach did not change.	Approach for protection of higher trophic organisms for parameters that were "missed" based on the COPC identification process used.
CRP V4 Appendix X-8.1 Section 2.4.2 General Methodology for Selecting Contaminants of Potential Concern	For parameters without applicable guidelines, how will Diavik assess them? For example, antimony is associated with site activity but does not have a guideline protective of aquatic life identified. How will a Closure Criterion for antimony in water be derived?	Additional information is required to ensure all COPCs are evaluated at closure.
CRP V4 Appendix X-8.1 Section 2.4.2 General Methodology for Selecting Contaminants of Potential Concern	The basis for Daivik Diamond Mine Benchmarks has not been provided in the report. Evaluation as to the appropriateness of these benchmarks cannot be made.	Provide a descritption of the derivation of the Diavik Diamond Mine Benchmarks.
CRP V4 Appendix X-8.1 Section 2.4.3.3 Fish Tissue	Consideration for exposure of humans and wildlife to COPCs in plants and animals was not given, with the exception of mercury and selenium. Food-chain transfer must be considered as this could be a dominant exposure pathway.	Include food-chain modeling in the derivation of the SSRBCC.

TOPIC	COMMENT	RECOMMENDATION
CRP V4 Appendix X-8.1 Section 2.4.5 - Selection of Contaminants of Potential Concern for Human Receptors	Concerns regarding the approach for COPC identification remain. The approach used is not standard practice and will result in the exclusion of parameters that should be retained as COPCs and have SSRBCC developed. However, since Diavik has committed to using the CCME EQG and HC guidelines for all parameters for which SSRBCC have not been derived, the concern is mitigated by this approach. It should be noted that the purpose of identifying COPCs in a risk assessment and for developing site specific standards is the same and the same premise should apply. COPC selection was not reviewed again as the approach did not change.	Diavik should include in this section that all parameters not identified as a COPC will have the applicable CCME EQG and Health Canada's drinking water guidelines (or other applicable jurisdiction is CCME and HC do not have values derived) set as the Closure Criteria.
CRP V4 Appendix X-8.1 Section 2.4.5 - Selection of Contaminants of Potential Concern for Human Receptors	The basis for Diavik's project-specific drinking water benchmarks was not provided, and therefore could not be reviewed for validity.	Provide basis for Project-specific Benchmarks.
CRP V4 Appendix X-8.1Figure 2.5-1 Eco Conceptual Site Model	The following comments apply: - a CSM for each of the management areas should be provided as there is too much information on this page; - food ingestion is identified as an incomplete pathway and yet this is a dominant pathway for many organisms, this pathway must be assessed and exposure through food (plant and animal) considered in the derivation of the SSRBCC; - soil ingestion is being shown as a complete exposure pathway to aquatic receptors, please clarify; - it appears that fish ingestion by the terrestrial invertebrate community is a complete exposure pathway. ROCs should be catagorized by Guilds and complete exposure pathways for each guild should be presented.	Provide CSM for each management area, clearly indicate applicable exposure pathways for each guild, food-chain transfer must be considered.
CRP V4 Appendix X-8.1Figure 2.5-2 Human Conceptual Site Model	Additional exposure pathways need to be shown. For example, inhalation of dust, soil dermal contact, dermal contact of water etc.	Revise CSM
CRP V4 Appendix X-8.2 Phase II Report Section 1.2.2 Mammals and Birds	This section indicates that Perigrine Falcon and Bald Eagle would only be exposed to COPCs through water ingestion and therefore 100% of the TRV is given for this pathway. Peregrine Falcon and Bald Eagle would also be exposed to COPCs through food chain accumulation, and therefore evaluation of these receptors needs to be revised.	Revise SSRBCC to account for exposure to birds of prey from food potentially impacted by the Site.

TOPIC	COMMENT	RECOMMENDATION
CRP V4 Appendix X-8.2 Phase II Report Table 3.2-1 - SSRBC Water - Various	The basis of the Diavik Water Quality Benchmark is not provided. For some parameters, it is not clear how the SSRBCC has been arrived at. For example, the SSRBCC for antimony of 0.0286 mg/L indicates it is protective of the toddler, yet the drinking water quality guideline of 0.006 mg/L which is protective of potable water for all human receptors and is lower than the "toddler" number is not used. Additional rationale for the selection process is required. It appears that this table is attempting to group COPCs in water for both human and ecological receptors. This process is not transparent and needs to be revised. The risk-based number protective of all species considered (i.e., humans, aquatic organisms, birds, mammals) should be shown in a table for each COPC and the most stringent of the receptors chosen as the SSRBCC. The SSRBCC values have not been reviewed as the basis is not transparent	Revise Table 3.2-1 to include the risk-based number protective of each receptor for each pathway and show a column for the SSRBCC that indicates that selection of the most stringent risk-based concentration as the SSRBCC for water.
CRP V4 Appendix X-8.2 Phase II Report Table 3.3-1 - SSRBC Sediment	This table defaults to the CCME ISQG as the SSRBCC, however, it is indicated that the receptor for which they are based is sandpiper, aquatic life or benthic invertebrates. When comparing the sediment values protective of sandpiper, the risk-based closure numbers are different. For example, sandpiper as a SSRBCC for arsenic in sediment of 0.501 mg/kg (Table V12).	As the CCME Sediment Quality Guidelines are not protective of higher trophic levels, rationale for setting the SSRBCC at a concentration less than the SSRBCC calculated must be provided.
CRP V4 Appendix X-8.2 Phase II Section 2.2: Aquatic Life Toxicity Thresholds	Diavik needs to support the following statement " the EC50 and LC50 toxicity thresholds applied in the SSRBCC derivations are not expected to produce population or community level effects (e.g., abundance) in the receptor groups where they were applied". It is not clear how a laboratory effect of 50% of the individuals would not translate to a population/community effect in the field. If the toxicity threshold was set at an EC10, the reviewer would concur with the statement. This statement needs to be defended with scientific information.	Provide a scientific rationale for the approach.
CRP V4 Appendix X-8.2 Phase II Report Section 2.2: Aquatic Life Toxicity Thresholds	Diavik needs to define what the protection goals are measured by (i.e., the acceptable effect level). The acceptable effect level needs to considered on a ROC basis. For example, a 20% reproductive impairment may be insignificant at the population level for one species (i.e., a water flea) but significant for another species (i.e., a grizzly bear).	State the measurement of the protection goal and modify the approach taken, in particular for aquatic receptors.

TOPIC	COMMENT	RECOMMENDATION
CRP V4 Appendix X-8.2 Phase II Report Table 2.1-1 Protection Goals	It is not clear why food chain modeling for the piscivorous fish has not been considered in the derivation of the SSRBCC.	Food chain modeling and exposure through diet should be considered.
CRP V4 Appendix X-8.2 Phase II Report Table 2.1-1 Protection Goals	The reference for each TRV should be provided. If the TRVS are derived by Diavik, then each TRV should have a rationale provided with it so that the basis can be reviewed for adequacy.	Additional information on the TRVS must be provided.
CRP V4 Appendix X-8.2 Phase II Report Table 2.2-1 Toxicity Reference Values for Aquatic Life Receptors	The reference for each TRV should be provided. If the TRVS are derived by Diavik, then each TRV should have a rationale provided with it so that the basis can be reviewed for adequacy.	Additional information on the TRVS must be provided.
CRP V4 Appendix X-8.2 Phase II Report Tables 2.3-1, 2.3-2, 2.3-4	The TRV provided for arsenic is based on non-cancer endpoints. As the non-threshold effects of arsenic are more sensitive, the SSRBCC for arsenic must be based on the protection of cancer. This comment was made in the initial review and was not addressed.	Revise arsenic TRV and SSRBCC protective of human health.
CRP V4 Appendix X-8.2 Phase II Report Table 2.3-4	The TRVs for molybdenum and selenium in Table 2.3-4 appear to be incorrect. Please verify the TRVs	Correct the TRVS.
CRP V4 Appendix X-8.2 Phase II Report Table 2.3-4	A number of SSRBCC have been set at concentrations above the value indicated to be protective of the most sensitive species. For example, the drinking water quality guideline for antimony is more stringent than the SSRBCC that was proposed (0.006 mg/L versus a SSRBCC of 0.0286). As the SSRBCC is supposed to protect the most sensitive species through the applicable exposure pathways, please explain why the SSRBCC for antimony is not based on the drinking water pathway. And the SSRBCC for cadmium is set at 0.000150 mg/L where the protection of aquatic organisms is 0.00009 mg/L.	Provide a rationale for the SSRBCCs set above the most sensitive receptors benchmark. The process of setting the SSRBCC for water is not transparent based on the information provided in Table 3.2-1.

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