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Staff Report

Applicant: De Beers Canada Inc.	
Location: Gahcho Kue, NT	Application: MV2005L2-0015 and MV2005C0032
Date Prepared: May 25, 2019	Meeting Date: June 6, 2019
Subject: Version 4.1 Interim Closure and Reclamation Plan	

1. Purpose/Report Summary

The purpose of this Report is to present to the Mackenzie Valley Land and Water Board (MVLWB/the Board) the Gahcho Kue Interim Closure and Reclamation Plan (ICRP) Version 4.1 (V.4.1) submitted by De Beers Canada Inc. (De Beers) to fulfill/satisfy Condition 84 of Land Use Permit (Permit) MV2005C0032 and Part J, condition 1 of Water Licence (Licence) MV2005L2-0015.

2. Background

- November 28, 2013 – Conceptual Closure and Reclamation Plan (ICRP V.1) submitted to the Board following conclusion of Environmental Impact Review;
- August 11, 2014 – Board issues Permit MV2005C0032 and submits recommendation for approval of Licence MV2005L2-0015 to the Minister of Environment and Natural Resources – Government of the Northwest Territories (Minister of GNWT-ENR);
- September 23, 2014 – Minister of GNWT-ENR approves Licence MV2005L2-0015;
- September 24, 2014 – Board issues Licence MV2005L2-0015 to De Beers; De Beers hosts a closure and reclamation workshop;
- March 2, 2016 – De Beers hosts a workshop to discuss draft ICRP (V.2);
- July 25, 2016 – De Beers submits ICRP (V.3) to the Board;
- October 7, 2016 – Board staff hosts ICRP technical workshop;
- January 12, 2017 – Board defers approval of the ICRP (V.3) to allow additional time for refinement of major components; Board requests revision and resubmission of the ICRP (V.3) objectives in accordance with comments received during the review;
- February 1, 2017 – De Beers submits the revised ICRP (V.3) objectives to the Board;
- March 16, 2017 – Revised ICRP (V.3) objectives approved as an interim submission; Board directs revision and resubmission of the ICRP closure options and Reclamation Research Plans (RRP) in accordance with comments received during the review;
- May 5, 2017 – De Beers submits revised options and RRP to the Board;
- September 14, 2017 – Revised options and updated RRP approved as an interim submission. Board requests the closure criteria be revised and resubmitted in accordance with comments received during review of ICRP (V.3);
- October 26, 2017 – De Beers submits the revised closure criteria to the Board;

- December 14, 2017 – Board staff hosts closure criteria technical workshop;
- February 13, 2018 – De Beers’ revised closure criteria approval deferred and De Beers directed to resubmit ICRP V.4 by April 13, 2018;
- May 14, 2018 – ICRP V.4 submitted to the Board;
- June 5, 2018 – ICRP V.4 distributed for review;
- August 7, 2018 – Review comments due and submitted;
- August 21, 2018 – De Beers’ response due and submitted including an updated ICRP V.4;
- November 7, 2018 – ICRP V.4 presented to the Board with direction to resubmit V4.1 for staff conformity by January 31, 2019;
- December 5, 2018 – De Beers request an extension for the submission of ICRP V.4.1;
- January 17, 2019 – Board approves De Beers’ extension request to March 29, 2019;
- March 29, 2019 – ICRP V4.1 submitted to the Board;
- **June 6, 2019 – ICRP V4.1 presented to the Board;**
- August 8, 2019 – Expiry of Permit MV2005C0032; and
- September 30, 2028 – Expiry of Licence MV2005L2-0015.

3. Discussion

Submission Description

On [January 12, 2017](#), the Board deferred the approval of ICRP (V.3) and requested refinement of 3 major components - (1) Objectives, (2) Options and Reclamation Research Plan, and (3) Closure Criteria - for resubmission and separate public reviews (Board decisions and directives attached). Revised Closure Objectives and revised Closure Options and Reclamation Research Plans were reviewed and approved as interim submissions (on [March 16, 2017](#) and [September 14, 2017](#), respectively). The approval of revised Closure Criteria was deferred (on [February 13, 2018](#)) since the Board’s analysis determined that it required further refinement. At this time, De Beers was directed to submit its ICRP V.4 incorporating direction given by the Board during all previous reviews. ICRP V.4 was submitted on May 14, 2018 and updated based on some reviewer comments on August 21, 2018.

On November 7, 2018, the Board did not approve V.4 and directed De Beers to update the ICRP based on Board direction and to resubmit V.4.1. The Board’s decision was based on lack of attention on De Beers’ part to neither follow Board direction nor commitments made by De Beers following the previous review. On March 29, 2019, De Beers submitted ICRP V.4.1. This submission included a table, responding to Board direction, a full marked-up version of all edits made to the ICRP V.4.1, and a clean copy. In line with Board direction and based on the relatively low numbers of comments received by reviewers on ICRP V.4, ICRP V.4.1 was not distributed for review and underwent an internal conformity review by Board staff.

Regulatory Requirements

Licence [MV2005L2-0015](#) and Permit [MV2005C0032](#) require submission of an ICRP as per the following conditions:

Licence MV2005L2-0015: Part J, condition 1 states that:

Within twenty-four (24) months following issuance of this Licence, the Licensee shall submit an **Interim Closure and Reclamation Plan** to the Board for approval, in accordance with the Mackenzie Valley Land and Water Board and Aboriginal Affairs and Northern Development Canada’s November 2013, or subsequent editions, *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*. In addition to conforming with the Guidelines, the Licensee shall:

1. Propose methods to reduce the period of time required for the recovery of the Water Management Pond;
2. Include a research plan for investigating cover options for the Waste Rock piles and processed kimberlite; and
3. Include any implications from the results of the Rock Placement Verification Program required under Part E, item 7 have on Waste Rock handling and closure and Reclamation options.

Licence MV2005L2-0015: Part J, condition 4 states that:

The Licensee shall submit a revised **Interim Closure and Reclamation Plan** upon request of the Board.

Permit MV2005C0032: Condition 84 states that:

The Permittee shall submit an **Interim Closure and Reclamation Plan**, to the Board for approval, in accordance with the Mackenzie Valley Land and Water Board and Aboriginal Affairs and Northern Development Canada's November 2013, or subsequent editions, *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*.

Approach and Analysis

In evaluating ICRP V.4, Board staff reviewed and carried out conformity checks based on the previous rounds of Board direction. Board staff also considered responses to reviewer comments and recommendations on ICRP V.3, each ICRP component since the distribution of ICRP V.3, and ICRP V.4. The ICRP V.4 review resulted in a series of tables outlining inconsistencies and deficiencies in the submission. These tables (attached) provided direction for De Beers for V.4.1 and have been used primarily for the review of V.4.1.

4. Security

The Board has set security in the amount of \$23,776,270.00 as per Part C, condition 1 and Schedule 1 of Licence MV2005L2-0015 and \$13,844,096.00 as per Condition 56 of Permit MV2005C0032 for the Gahcho Kue project. De Beers' next deposit of security (in the amount of \$17,732,485.00 under Licence MV2005L2-0015 and \$24,675,843.00 under Permit MV2005C0032) is due prior to year 5 of Operations (the end of mining of the Hearne Pit).

5. Conclusion

ICRP V.4.1

De Beers was required to update ICRP V.4 for Board approval based on Board direction and commitments made by De Beers throughout the ICRP V.3 review process. In its review, Board staff identified many omissions and examples of non-conformity throughout ICRP V.4. The inconsistencies and missing information were identified in detail and provided to De Beers. In response, De Beers submitted a thorough and accurate list of all changes made in the ICRP, including a version indicating where all updates and changes have been made and what comments and commitments they address. Though there remain some fundamental differences in opinion for the closure approach and room for improved consistency throughout the plan regarding the closure schedule, the overall plan and its relationship to operational design and monitoring is much better defined.

In many cases, the development of specific closure criterion is being deferred to the completion of reclamation research plans, operational monitoring results, final design reports, and/or post-closure risk assessments. Board staff believe the outstanding details are required prior to approval of closure criteria. Board staff also believe that a thorough review by all parties should be carried out prior to granting approval of closure criteria.

In its updated ICRP and responses provided in Tables 1 through 6, De Beers identified its intention to submit a Post-Closure Risk Assessment and final design plans with the Final Closure and Reclamation Plan (FCRP). These documents might inform specific details or adjustments to closure criteria and/or monitoring. Board staff suggest that there might be a way to progressively review and approve the results of reclamation research plans and final design plans so that the ICRP can be updated sequentially, prior to the submission of the FCRP. This would lighten the volume of new information provided by De Beers to reviewers at the time of the FCRP submission.

ICRP V.5

Similarly, Board staff suggest that the Board consider directing De Beers to resubmit an updated ICRP (ICRP V.5) for review and approval prior to the submission of the FCRP (expected around 2026).

Without identifying a specific date at this time, Board staff suggest resubmission of the ICRP close to 2024 for the following reasons:

- To reflect recent and anticipated Amendments to the project and to be consistent with the updated security estimate;
- Revegetation criteria may be identified by the end of 2024 according to Section 2 of the RRP;
- Final Landform and Cover Stability Research should be complete by the end of 2020 according to Section 2 of the RRP;
- De Beers will have collected between 5-6 years of monitoring data that can be used to update the plan and perhaps other closure criteria (seepage/water quality, wildlife, air quality);
- Engineered structure designs should be (mostly) complete (South Mine Rock Pile complete and PK Facilities will be almost complete) as indicated in Section 3 of the RRP by 2023;
- Options analysis for site wide drainage pathways and conceptual plans for drainage from waste piles, PK Facilities, and general site wide drainage should be complete as indicated in Section 3 of the RRP by 2023; and
- The FCRP is due two years prior to closure which is estimated to be 2028. 2024 should provide adequate time to review any interim changes to the Mine Operations and closure plans prior to the final submission.

6. Recommendation

Board staff recommend the Board:

- a) **Make a motion to approve the Interim Closure and Reclamation Plan (ICRP V.4.1)**, except for closure criteria, as required by condition 84 of Land Use Permit MV2005C0032 and Part J, condition 1 of Water Licence MV2005L2-0015.

Board staff recommend including the Tables attached to this Staff Report in the decision letter so that they can be referenced if and when ICRP V.5 is required.

As mentioned above, Board staff recommend that the Board require the eventual submission of ICRP V.5, prior to submission of the FCRP. This can be referenced in the decision letter provided however Board staff recommended maintaining flexibility for the timing of the Board's request so as to respond to potential project changes that may occur between now and the Mine's planned closure.

A draft decision letter is attached.

7. Attachments

- [ICRP V.4.1](#)
 - [Conformity Table](#)
- Board Staff responses to Conformity Table
- Draft Reasons for Decision
- Draft Decision Letter from the Board

Respectfully submitted,



Shannon Allerston
Regulatory Specialist

Table 1: Issues of Conformity - Objectives

Board Interim Approved Closure Objectives as shown in De Beers' Conformity Table	Closure Objectives in ICRP V.4		Comments	De Beers Response
	SW5 - Promote accelerated natural recovery of vegetation at disturbed areas.		This objective was not approved by the Board (on an interim basis) on March 16, 2017 and is not part of the Board directive for Objectives issued to De Beers that same day. On November 25, 2016, De Beers agreed that this objective was better suited for Infrastructure (I2) since it did not intend to include the Mine Rock piles or PK facilities. Board directs De Beers to amend Table 20 and reflect all criteria, activities, monitoring and research identified with old SW5 under I2, as appropriate. This change has implications on references used throughout ICRP V.4.	This objective was a relic from previous versions of the ICRP that was mistakenly not removed from Table 20. The rest of the ICRP was not impacted by this relic and all references were previously correctly updated to reflect the move of the revegetation objective to infrastructure (I2). Objective is removed and Table 20 amended to reflect the interim approved objectives.
SW5 - Safe passage and use for Caribou and other wildlife.	SW6 – Safe passage and use for Caribou and other wildlife.		Should be SW5, not SW6 to reflect the changes directed by the Board on March 16, 2017 to former SW5 and SW7 Objectives. This change may have implications throughout ICRP V.4. Boards direct De Beers to amend Table 20 to reflect the changes directed by the Board on March 16, 2017.	Table 21 (formerly 20) is amended to reflect the interim approved objectives.
	SW7 – Aesthetic conditions of the Mine area are similar to surrounding natural conditions.		This objective was not approved by the Board (on an interim basis) on March 16, 2017 and is not part of the Board directive for Objectives issued to De Beers that same day. On November 25, 2016, De Beers agreed that this objective was better suited for Infrastructure (I3) since it did not intend to include the Mine Rock piles or PK facilities. Board directs De Beers to amend Table 20 and reflect all criteria, activities, monitoring and research identified with SW7 under I3, as appropriate. This change has implications on references used throughout ICRP V.4.	This objective was a relic from previous versions of the ICRP that was mistakenly not removed from Table 20. The rest of the ICRP was not impacted by this relic and all references were previously correctly updated to reflect the move of the revegetation objective to infrastructure (I2). Objective is removed and Table 21 (formerly 20) amended.
OP1 - The backfilled and/or flooded pits will not adversely impact establishment and/or maintenance of sustainable aquatic ecosystems and life in the overlying Kennady Lake and downstream waterbodies.	OP1 – The backfilled and/or flooded pits will not adversely impact establishment of sustainable aquatic ecosystems and life in the overlying Kennady Lake and downstream waterbodies.		The wording of this objective in ICRP V.4 does not match that as approved by the Board (on an interim basis) on March 16, 2017. On November 25, 2016, De Beers agreed to change the wording of this objective based on reviewer recommendations. Board directs De Beers to amend Table 20 to reflect the Board approved wording of Objective OP1.	Table 20 is amended to reflect Board approved wording of Objective OP1.
MR2 - Contaminated rock and non-hazardous waste disposal areas within piles will be safe aquatic life, people or wildlife.	MR2 - Contaminated rock and non-hazardous waste disposal areas within piles do not pose an unacceptable risk to aquatic life, people or wildlife.		The wording of this objective in ICRP V.4 does not match that as approved by the Board (on an interim basis) on March 16, 2017. These changes were directed by the Board to address reviewer comments and recommendations and De Beers' commitment to defining "safe" in ICRP V.4. "Safe" is not provided as a defined term in Appendix A of ICRP V.4, as committed to by De Beers on November 25, 2016. Board directs De Beers to amend Table 20 to reflect the Board approved wording of Objective MR2 and to provide a definition for "safe" in Appendix A of the ICRP.	Objective MR2 is amended in Table 21 (formerly 20) to reflect Board approved wording. Safe is generally defined as "not likely to cause harm or injury". A definition for "safe" is added in Appendix A of the ICRP.

Table 2: Missing Information - RRP

Reclamation Research Plan from ICRP V.4	Board Direction		Comments	Response
Table E1: Summary of research commitments and status.	N/A		On June 9, 2017, De Beers' committed to carry out site surveys to record the extent of land disturbance and update Table E1. This was not reflected in the updated RRP in ICRP V.4. Boards directs De Beers to amend Table E1 as committed to on June 9, 2017.	As noted in Table E1, commitment No. 32, a general site survey is to be completed that will identify disturbed areas. No further specification of this commitment is considered necessary. No adjustment made to ICRP.
Section 2.1: Site Wide: Revegetation Task 1: Desktop Review Task 2: Upland and Riparian Revegetation Test Plots Task 3: Overburden Stockpile Volume Balance and Management Task 4: Development of Revegetation Closure Criteria Task 5: Revegetation Plan	On September 14, 2017 the Board required the following: Section 2.1 of the RRP states that the ICRP does not consider revegetation of the PK piles but also stated that it is subject to stakeholder's interest. Other sections of the RRP mention that revegetation options at priority areas on or around mine rock and PK piles will be investigated. Please provide more detail on what those priority areas may be, how or when they will be identified, and how criteria will be developed to determine their success as landform features. The options presented in the RRP should be reflected in ICRP V.4.		De Beers does not provide clarity on what "priority areas" on or around mine rock and PK piles are. De Beers plans to provide a finalized list of priority areas during Task 5 and how criteria will be developed to determine their success as landform features. Task 5 is expected to be complete by 2025. Board directs De Beers to list the criteria that will be considered in the identification of priority areas (e.g., easiest place to achieve revegetation, community priorities, unique features, etc.) and the approximate footprint those priority areas are expected to cover to meet closure objectives, principles and goals.	Priority areas for revegetation will likely include infrastructure/building locations, haul roads and laydowns. This detail has been added to Section 2.1.3 Tasks 3 and 5. Priority areas will be refined through engagement and various criteria. Cross-reference to the research section where the engagement to identify priority areas occurs (Section 2.3.3 Task 3) has been added to Section 2.1.3 Task 3 and 5. Examples of criteria that may be considered in identification of priority areas has been added to Section 2.1.3 Task 5. Priority areas are not yet fully refined and the final footprint is unknown at this time. However, for the areas identified as likely priority areas, their total footprint has been added to Section 2.1.3 Task 3 and 5. The final footprint for priority areas will be identified after the community engagement completed under Section 2.3.3 as well as informed by the criteria from Section 2.1.3 Task 4. Reference to Task 4 has been added to Task 5. Completion of revegetation activities at those priority areas to the criteria levels that is determined through research, will meet the objective. Wording has also been adjusted in Section 2.1.4 to clarify that engagement from Section 2.3 will identify priority areas for the entire mine site, not just for the Mine Rock and PK Piles. The above detail has also been added to the main body of the ICRP where priority areas are mentioned, including Section 5.2.3 Table 21 (formerly 20), within the closure activities column for objective I2, and Section 5.2.5.5.11.. ☐

<p>On September 14, 2017 the Board required the following:</p> <p>Task 2: In V.4 or future iteration of the ICRP, please clarify how observations from test plots beyond the submission of the Final Closure and Reclamation Plan will be integrated into mine closure planning and evaluation.</p>		<p>Integration of data from test plots beyond submission of the Final Closure and Reclamation Plan (2025-2026) has not been discussed as directed by the Board.</p> <p>Board directs De Beers to explain observations from test plots beyond the submission of the Final Closure and Reclamation Plan will be integrated into mine closure planning and evaluation.</p>	<p>Test plots is terminated following FCRP submission. Research scheduling is revised in Appendix E Figure E.1 to reflect termination of test plots at time of FCRP submission.</p>
<p>On September 14, 2017 the Board required the following:</p> <p>Task 4: Final land classifications and final criteria are not being established until operational data and monitoring results of various programs (revegetation studies among them) are compiled. Understanding that setting achievable criteria requires results from monitoring programs or reclamation research, De Beers should be able to set standards now that would best achieve objectives such as I3 (similar to surrounding natural conditions). In V.4 of the ICRP, De Beers should outline how revegetation research efforts can strive to establish and reflect unique habitat and aesthetic conditions recorded at Gahcho Kué prior to mine development. This does not automatically tie De Beers to establishing criteria reflecting the recreation of original land classifications/vegetation, but it sets a higher standard in the effort to identify what is (or may be) achievable at closure through extensive research efforts.</p>		<p>De Beers does not outline how revegetation research efforts can strive to establish and reflect unique habitat and aesthetic conditions recorded at Gahcho Kué prior to mine development. On November 25, 2016 De Beers agreed with reviewer comments to use ecological land classifications as starting points from which to develop research objectives and stated that “ecological land classifications present at the site at baseline will inform the plant species that could be applied to disturbed areas as part of closure... De Beers agrees that effort and research should strive to return disturbed areas to ecological land classification units that are common in the Gahcho Kué area.” On May 14, 2018, in response to the Board directive, however, De Beers does not provide additional information on land classifications in its RRP, as requested by the Board.</p> <p>Board directs De Beers to explain how baseline ecological land classifications will be used to inform revegetation research efforts so that De Beers can strive to establish and reflect unique habitat and aesthetic conditions recorded at Gahcho Kué prior to mine development.</p>	<p>Wording is added to Section 2.1.3 Task 2 of the RRP specifying how selected plant species used in revegetative research and efforts is informed by the baseline ecological land classifications and observed vegetation within the Mine area. General information on the baseline land classification is provided in Section 3.4.2 of the ICRP. Reference to this section is added to the RRP (Section 2.1.3 Task 2).</p> <p>Wording is added to Section 2.1.3 Task 5 stating how the anticipated post-closure ecological land classes is presented, and the baseline ecological land class will aid in identifying post-closure ecological land classes that are similar.</p>
<p>On September 14, 2017 the Board required the following:</p> <p>2.1.4 Linkages to Other Research: In V.4 of the ICRP, De Beers should provide appropriate references to ongoing wildlife monitoring and progressive reclamation efforts and explain if and how those efforts are informing reclamation research. Any linkage between active monitoring programs, reclamation research programs, and the establishment and monitoring of criteria should be provided in the V.4 of the ICRP.</p>		<p>There is limited discussion about how ongoing wildlife monitoring and progressive reclamation efforts are or will inform revegetation reclamation research. More details were provided in De Beers’ responses on November 25, 2016 and May 5, 2017.</p> <p>Board directs De Beers to describe any linkage between active monitoring programs, reclamation research programs, and the establishment and monitoring of criteria in ICRP V.4.1.</p>	<p>Results from revegetation monitoring will examine wildlife interactions with test plots; dependent on the situation this may or may not impact research results and final reclamation planning. The RRP acknowledges this (see RRP Section 2.1.3 Task 2).</p> <p>Additional detail from the Nov 25 and May 5 responses regarding the link between wildlife monitoring and interpretation of research results, and subsequent implications for progressive or final reclamation efforts, has been added to Section 2.1.3 Task 2 and Task 5.</p> <p>Additional detail from the Nov 25 and May 5 response regarding the link between wildlife monitoring at closure and achievement of criteria, has been added to Section 2.1.3 Task 5.</p> <p>A statement highlighting the link between operational monitoring, research, reclamation activities and monitoring of criteria has been added to Section 2.1.4.</p> <p>An additional column outlining the operational monitoring programs, including wildlife monitoring, has been added to ICRP Section 5.2.3 Table 21 (formerly 20), along with their general contribution to final designs, research, criteria and post closure monitoring.</p>
<p>Section 2.2: Site Wide: Post Closure Seepage Quality and Quantity</p> <p>Task 1: Data Collection</p> <p>Task 2: Comparison of Measured and Predicted Seepage Data</p> <p>Task 3: Assessment of PK Weathering</p>	<p>On September 14, 2017 the Board required the following:</p> <p>Task 2: Please reference Plans regarding action levels or mitigation measures (where identified in De Beers’ May 5, 2017 and June 9, 2017 responses) in the RRP. Task 2 involves the comparison of measured water quality data with predicted outcomes documented in the EIS so that post-closure water quality and quantity estimates can be refined. V.4 of the ICRP should describe how adaptive management strategies and contingencies will be developed if water quality data is worse than predictions. For example, the trigger for developing an adaptive management strategy and mitigation options. If the details and timing associated with any research into mitigation options are found elsewhere, specific references and a summary of the relationship with the research plan should be provided.</p>	<p>De Beers has not provided references to where adaptive management strategies can be found in the event that Task 2 activities identify discrepancies between EIS predictions and measured water quality results from various monitoring programs. Details the Board have asked for will be provided by De Beers in its May 5, 2017 and June 9, 2017 responses but are not reflected in the updated RRP (i.e. Annual Water Licence Reports, and low action levels articulated within the Groundwater Monitoring Program, and the Aquatic Effects Monitoring Program, and the Operational Water Management Plan).</p> <p>Board directs De Beers to include information and references to adaptive management strategies from its May 5, 2017 and June 9, 2017 responses in ICRP V.4.1.</p>	<p>Reference to the monitoring programs containing the adaptive management strategies is added within Section 2.2.3 Task 2, in addition to general description of what the adaptive management measures may include, including initiation of Task 2 activities themselves should discrepancies between monitoring results and predictions be identified beforehand.</p>

Section 2.3: Site Wide: Final Landform Options to Support Wildlife Habitat Task 1: Desktop Review Task 2: Evaluation of Habitat Suitability Index Task 3: Engagement and Feedback	On September 14, 2017 the Board required the following: 2.3.1 Uncertainty: Landform re-use is not expected to be limited to re-vegetated areas. Establishing suitable criteria to determine the success of chosen landform options for each species or habitat function is not explained. V.4 of the ICRP should describe: (1) how measurable criteria are being established for the chosen landform option to meet the objective, and (2) when and how mitigation efforts will be implemented if criteria are not being met.		The ICRP V.4 RRP does not explain how criteria might be developed to measure the success of chosen landform features to support species or habitat at closure. The development of measurable criteria to determine the success of final landform options is not identified as part of the RRP. If monitoring on the success of the chosen landform options is planned following reclamation, when and how will mitigation efforts be implemented if criteria are not being defined? Board directs De Beers to explain how it plans to determine the success of chosen landform options for each species or habitat function by responding to the following questions in ICRP V.4.1: (1) how measurable criteria are being established for the chosen landform option to meet the objective, and (2) when and how mitigation efforts will be implemented if criteria are not being met.	Research is to identify landform options and the preferred option. Existing criteria will demonstrate compliance with final design and acceptable risk as completed through a risk assessment, as well as use of the site by wildlife (i.e. birds, mammals) as documented through post closure monitoring. Additional criteria are not necessary. Any implemented options for the landform design will be evaluated for their ability to meet the criteria for use by wildlife. The minimum level of use to meet the criteria will be defined in the FCRP. The site will be monitored during operation and closure. Additional mitigation measures will be implemented to meet the criteria. The final landform design will include an adaptive management strategy to link monitoring with potential mitigation efforts, This detail is added to the reclamation activities for SW5 in Table 21 (formerly 20) of the ICRP. Clarification on the development of the final landform design and adaptive management strategy, using operations to inform its design and approximate timing, and how it is used to ensure criteria are achieved, has been added to RRP Section 2.3.3 Task 3.
	On September 14, 2017 the Board required the following: 2.3.4 Linkages to Other Research: In V.4 of the ICRP, De Beers should provide appropriate references to ongoing wildlife monitoring and progressive reclamation efforts and explain if and how those efforts are informing reclamation research.		De Beers does not provide references to explain how ongoing wildlife monitoring and progressive reclamation efforts could help inform reclamation research for final landform options. Board directs De Beers to describe any linkage between active monitoring programs, reclamation research programs, and the establishment and monitoring of criteria in ICRP V.4.1.	Operational wildlife monitoring does not feed into the research tasks for final landform options. Wildlife interactions with test plots is assessed as part of revegetation research, as noted in RRP Section 2.1 Task 2. Reference to this aspect of the revegetation research is added to Section 2.3.4 of the RRP. Operational wildlife monitoring is a consideration in final landform options during development of the final landform plan. To clarify this, the use of monitoring results, including wildlife, use, attractant/deterrent features, preferred corridors, risk areas, etc. to inform final landform design has been added to RRP Section 2.3.3 Task 3. Wildlife interaction observed through operational wildlife monitoring is also added to the list of considerations for final landform options within Section 5.2.4 Table 22 (formerly 21) Infrastructure. An additional column outlining the operational monitoring programs, including wildlife monitoring, has been added to ICRP Section 5.2.3 Table 21 (formerly 20), along with their general contribution to final designs, research, criteria and post closure monitoring.
		References in De Beers' May 14, 2018 response refer to old Objectives that appear in ICRP V.4 but have not been approved by the Board. Board directs De Beers to address all instances throughout the RRP, body of ICRP V.4, and conformity table where references to old objectives and criteria (SW 5 and SW7) are made.	Old objectives is removed and all references revised as necessary throughout ICRP V4.1.	
Section 3.1: Physical Stability of Engineered Covers Task 1: Desktop Review Task 2: Geotechnical Investigation	N/A		Table 20 of ICRP V.4 identifies Section 3 of the RRP as informing Objective SW1 by identifying required cover thickness and material in order to achieve the post-closure air quality objectives. There is no mention of air quality as a requirement for determining appropriate cover design in the RRP. Board directs De Beers to clarify any linkage between RRP Section 3 and Objective SW1.	The design of the FPK facility cover will take into the consideration of dust emissions from wind erosion. Additional research is not required. Description in Table 21 (formerly 20) is updated. This consideration has also been added to RRP Section 3.1.3 Task 1.
	See SW2 Options Discussion below.		See SW2 Options Discussion below.	
	N/A		Figure 40 of ICRP V.4 identifies the construction of a rock cover for the Fine PK Facility beginning in 2021 but the geotechnical investigations outlined in the RRP indicate completion in 2023. Board directs De Beers to clarify how the timing of these activities will work for closure.	Geotechnical investigations will inform cover design for the Fine PK Facility. The investigations will continue following closure of the Fine PK Facility to support the cover design for the Coarse PK Pile. With the initiation of rock cover construction at the Coarse PK Pile in 2026, the geotechnical investigation is considered fully completed. Wording has been adjusted for clarification regarding these timelines in RRP Section 3.1.3 Task 2.

<p>Section 4.1: Stability of Chemocline within Flooded Pits</p> <p>Task 1: Desktop Review</p> <p>Task 2: Comparison of Measured and Predicted Pit Water Quantity and Quality Data, Assessment of Implications to Closure</p> <p>Task 3: Refinement of the Open Pit Water Quality Predictions</p> <p>Task 4: Development of Numerical Closure Criteria</p>	<p>On September 14, 2017 the Board required the following:</p> <p>Task 2: Involves the comparison of measured water quality data with predicted outcomes documented in the EIS so that post-closure water quality and quantity estimates can be refined. Please include a task equivalent to the De Beers commitment to implement adaptive management strategies if it is identified that the quality of runoff or seepage is worse than predictions.</p> <p>The description of Task 2 implies the final goals are a moving target based on measured data (not predictions). Board recommended that De Beers provide more details in the RRP that identify when adaptive management or mitigation measures will be identified and what mitigation options are or will be considered to address possible exceedances in water quality in the Open Pits or at Kennady Lake.</p> <p>Task 4: introduces the development of criteria for measuring the success of objective OP1. Please explain how the balance between appropriate criteria and water quality prediction refinement will ensure the success of OP1 in V.4 of the ICRP.</p>		<p>On Nov 25, 2016, De Beers committed to updating this RRP to articulate that this research component will incorporate analyses and modelling of pit interactions with groundwater and how those interactions are expected to affect meromictic conditions into the future. This has not been done.</p> <p>Board directs De Beers to investigate how pit interactions with groundwater might affect meromictic conditions as part of RRP Section 4.</p> <p>De Beers provides a reference to the Groundwater Management Plan which contains low action levels and associated management responses but the text of Task 2 implies no active mitigation, only refinement of predictions and model updates if water quality results exceed predictions. It is not clear how appropriate criteria might be determined at Task 4 to meet OP1 and KL1 objectives if the only responses to water quality exceedances are passive.</p> <p>Board directs De Beers to provide more details in the RRP that identify when adaptive management or mitigation measures will be identified and what mitigation options are or will be considered to address possible exceedances in water quality in the Open Pits or at Kennady Lake. If the information is provided in Section 5.2.9 of the ICRP, then that section can be referred to.</p>	<p>Wording is added to RRP Section 4.1.3 Task 3 specifying that post closure water quality predictions is revised and include among things how groundwater affects meromictic conditions.</p> <p>Text is added to Section 4.1.3 Task 4 of the RRP describing water quality predictions and numerical closure criteria is used to inform the Closure Water Management Plan as per part G Item 5 of the WL. The Closure Water Management Plan will describe the adaptive management and mitigations. The contingencies to manage water quality at closure are further described in Section 5.2.9.4 of the ICRP. Reference to this section is provided in the RRP.</p>
<p>Section 5.1: Timeline for reconnection of Kennady Lake to Surrounding Waterbodies</p> <p>Task 1: Data Collection and Analysis</p>	<p>N/A</p>		<p>Table 20: OP1 Research Reference to Appendix E, Section 5.1 is not included in ICRP V.4, as committed to by De Beers on Oct 26, 2017.</p> <p>Board directs De Beers to provide a reference to RRP Section 5 for OP1 in Table 20 of ICRP V.4.1 as committed to on Oct 26, 2017.</p>	<p>Reference to RRP Section 5.1 is added to OP1 in Table 20 of ICRP V4.1.</p>
<p>Task 2: Refinement of the Kennady Lake Water Quality Predictions and Water Management Options Assessment</p> <p>Task 3: Comparison of Measured and Predicted Water Quantity</p> <p>Task 4: Aquatic Progressive Restoration Pilot Project</p> <p>Task 5: Development of Measurable Closure Criteria</p>	<p>On September 14, 2017 the Board required the following:</p> <p>Provide more details in the RRP that identify when adaptive management or mitigation measures will be identified and what mitigation options are or will be considered to address possible exceedances in runoff and seepage water quality and quantity at Kennady Lake. If the details and timing associated with any research into mitigation options are found elsewhere, specific references and a summary of the relationship with the research plan should be provided.</p>		<p>De Beers suggests that moderate to high actions could include updating models and water management design features. None of the Plans referring to action levels or mitigation measures (where identified) are referenced in the RRP. Tasks 2 and 3 involve the comparison of measured water quality data with predicted outcomes documented in the EIS so that post closure water quality and quantity estimates can be refined. There is no task equivalent to the De Beers commitment to implement adaptive management strategies if it is identified that the quality of runoff or seepage is worse than predictions. It is not clear how appropriate criteria might be determined at Task 5 to meet OP1 and KL1 objectives if the only responses to water quality exceedances are passive.</p> <p>Board directs De Beers to describe any linkage between active monitoring programs, reclamation research programs, and the establishment and monitoring of criteria in ICRP V.4.1.</p> <p>Board directs De Beers to explain how it will balance water quality predictions from the EIS, operational monitoring results, the establishment of criteria, and development (and if necessary, implementation of) adaptive management so as to meet the objectives, principles, and goals of the ICRP and the EIS.</p>	<p>Additional detail regarding the adaptive management strategies employed by the operational monitoring programs to respond to action levels and initiate mitigation measures has been added to RRP Section 5.1.3 Task 1 as well as ICRP Section 5.2.9.4. A statement specifying the details for closure water management will first be developed for the FCRP and then refined later in the Closure Water Management Plan has been added to Task 2.</p> <p>As identified in Task 2 of RRP Section 5.1.3, operational data is used to inform closure water quality predictions. Water quality predictions will inform the closure water management strategy which is presented in the Closure Water Management Plan. The Closure Water Management Plan will specify adaptive management and mitigations. Reference to the adaptive management employed by operational monitoring programs as a source to inform the closure adaptive management, as well as the contingencies to manage water at closure as described in Section 5.2.9.4 of the ICRP have been added to RRP Section 5.1.3 Task 2. A statement specifying the details for closure water management will first be developed for the FCRP and then refined later in the Closure Water Management Plan has also been added to Task 2.</p> <p>As identified in Task 5 of RRP Section 5.1.3, the updated water quality predictions is used to develop closure criteria. Reference to the closure criteria for use in development of the Closure Water Management Plan has been added to RRP Section 5.1.3 Task 2. A statement detailing adaptive management and contingencies is included in the Closure Water Management Plan which is informed by operational adaptive management, and the results of Tasks 1 and 2 has been added to Task 3. Reference to the contingency descriptions in Section 5.2.9.4 of the ICRP were also added. Reference to the use of criteria to inform the Closure Water Management Plan and adaptive management has been added to Task 5.</p>
	<p>On September 14, 2017 the Board required the following:</p> <p>How can, or how will, De Beers' RRP help inform the identification of further action levels and mitigation responses in the event seepage water quantity and quality are higher than expected and how will it inform De Beers when changes to predicted levels have become significant enough to warrant action beyond the changing of targets.</p>		<p>De Beers should provide more details in the RRP that identify when adaptive management or mitigation measures will be identified and what mitigation options are or will be considered to address possible exceedances in water quality in the Open Pits or at Kennady Lake.</p> <p>Board directs De Beers to provide more details in the RRP that identify when adaptive management or mitigation measures will be identified and what mitigation options are or will be considered to address possible exceedances in water quality in the Open Pits or at Kennady Lake. If the information is provided in Section 5.2.9 of the ICRP, then that section can be referred to.</p>	<p>Refer to above response for Line 23.</p>
	<p>On September 14, 2017 the Board required the following:</p> <p>Task 3 and 5: Provide an updated RRP to clarify the closure criteria (fish, fish habitat, and water quality) intended to be developed during the course of reclamation research on Kennady Lake.</p>		<p>Task 5 reads: Criteria to define the successful use of fish habitat features at appropriate life stages, as well as, quantity of fish within Kennady Lake, will be developed to satisfy Kennady Lake closure objective KL1.</p> <p>KL1 is referred to again and again in Table 20 as the catch- all objective for measuring and comparing water quality objectives from all mine components (seepage, drainage, run-off, groundwater, etc.) yet there is no explicit need to develop water quality criteria identified in Task 5.</p> <p>Board directs De Beers to describe how RRP Section 5 will be designed to develop closure criteria for water quality coming from all mine components that feed water into Kennady Lake. Establishing appropriate water quality criteria for all mine components feeding Kennady Lake could prevent possible water quality exceedances in Kennady Lake.</p>	<p>As noted in De Beers' May 5, 2017 response, runoff and seepage waters from mine rock piles and PK facilities is directed and managed within the water management pond. Once refilling of Kennady Lake is initiated these areas is partially submerged themselves by Kennady Lake. Thus, the liquid portion from these facilities is considered addressed through the Kennady Lake objectives. It is not considered necessary to have separate water quality criteria for these separate components. The water quality of the refilling Kennady Lake is treated as a whole, with one single criteria, and only when that criteria is met will Kennady Lake be reconnected to the surrounding watershed.</p> <p>The RRP Section 5 will research and develop closure criteria for the whole of Kennady Lake. No change is considered necessary to the RRP or ICRP. The detail described here has been added to RRP Section 5.1.3 Task 5.</p>

Section 6: Schedule	N/A		Tasks identified in Figure E.1 do not match up with the tasks described in the body of the RRP for Section 2.1 or 2.2. Board directs De Beers to edit Figure E.1 to match all Sections and Tasks of the RRP appropriately.	Figure E.1 is revised to match all Sections and Tasks of the RRP.
	On September 14, 2017 the Board required the following: Clarify and explain if any of the contingencies identified in the ICRP will no longer be viable at a particular point in time. Provide more detail on how RRP will feed into the development of moderate to high action levels and identify the contingency plans required when it becomes clear that continued monitoring is not going to mitigate pending effects.		This was not done. Board directs De Beers to clarify and explain if any of the contingencies identified in the ICRP will no longer be viable at a particular point in time. Provide more detail on how RRP will feed into the development of moderate to high action levels and identify the contingency plans required when it becomes clear that continued monitoring is not going to mitigate pending effects.+28:31E2929:31	For water quality contingencies, most options will remain available until Kennady Lake is fully refilled. After this point, only dyke raises may be used. This statement has been added to ICRP Section 5.2.9.4. Adaptive management and mitigations is further defined in the Closure Water Management Plan. This detail has been expanded in RRP Section 2.2.3 Task 2, and Section 5.1.3 Tasks 1, 2 and 3. Detail has also been added to these sections as well as ICRP Section 5.2.9.4 on the adaptive management, action levels, contingencies from operational monitoring/management plans, and how they is used to develop the closure management plan and final designs. No restriction on Mine Rock Pile slope stability contingencies. A statement to this effect has been added to ICRP Section 5.2.9.2. Fine PK contingencies is updated in Section 5.2.9 with the current mine plan. Fine PK is deposited into the Fine PK Facility until Hearne Pit is mined out. In the event of a delay in the mined out Hearne Pit, the Fine PKC Facility is raised to accommodate additional PK. The need for additional contingencies is evaluated during operations as necessary based on changes in the mine plan, and be incorporated into an updated management plan. This detail has been added to ICRP Section 5.2.9.3. PAG material will no longer be deposited in mine rock piles when they've reached capacity, thus the option to place material in the piles will no longer be available once full. A statement to this effect has been added to ICRP Section 5.2.9.1. The Mine's Geochemical Characterization Plan presents the action thresholds and management responses associated with ARD drainage, as stated in Section 5.2.9.1. A statement specifying the incorporation of operational adaptive management into the final designs, management plans, monitoring etc has been added to RRP Section 2.2.3 Task 2. As identified in Section 5.2.9 of the ICRP, operational monitoring is compared to initial predictions and where appropriate further contingency measures is implemented as part of ongoing adaptive management. Text is added to Section 5.2.9 specifying that where applicable, the annual closure and reclamation plan is updated with relevant information regarding additional contingencies based on operational monitoring. The reclamation research plan is not to inform the ongoing adaptive management of the site. This is addressed through the
	On September 14, 2017 the Board required the following: In general, more clarification from De Beers is required for reviewers to understand how the results of each task and each phase of research identified in the schedules will inform the establishment of closure options (where still available) and measurable closure criteria to support the final closure goals and objectives. Clearly indicate how the results of each task/phase of research inform the establishment of closure options and criteria that will determine the success of final closure objectives. Where post-closure monitoring is required, after submission (and approval) of the Final Closure and Reclamation Plan, De Beers should provide reviewers and the Board with a plan to address any results that deviate from predictions and established closure criteria.		There is still obvious confusion among reviewers about how and when the RRP will inform closure. Board directs De Beers to develop a single table that shows how and when the results of each task and each phase of research identified in the schedules will inform the establishment of closure options (where still available) and measurable closure criteria to support the final closure goals and objectives.	Figure E.1 provides a summary schedule of each research task. The results of each task will inform closure options and criteria at the end of each task's timeline. Where the results of a specific task will inform the closure options and/or criteria for a specific project milestone (e.g. closure and cover of a mine rock pile), it is noted in the table. An additional table is not considered necessary.
	On September 14, 2017 the Board required the following: Any changes to RRP schedules as a result of delays to the Hearne Pit (or any other project amendments) should be submitted as a part of V.4 of the ICRP.		On June 9, 2017, De Beers indicated that Task 3 was linked to the flooding of Hearne Pit and that the schedule for implementing Task 3 would need to be updated. This does not appear to will be done in either Figure 40 of ICRP V.4 or in the RRP Schedule. Board directs De Beers to update Figure 40 and the RRP schedule, where appropriate to reflect changes as a result of delays to the Hearne Pit (or any other project amendments).	Figures 36 (formerly 32) and 44 (formerly 40) within the ICRP, and Figure E.1 within the RRP is revised for consistency with the timelines in the March 2018 UPD to reflect changes in the mine schedule. Timelines throughout the body of the ICRP have also been updated.

Table 3: Inconsistencies - Closure Options and Activities

Objective	Board Direction	Options and Activities in ICRP V.4	Comments	Response
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SW1 – Air quality levels safe for people, vegetation, aquatic life and wildlife.	N/A	<p>The text of Table 20 in ICRP V.4 reads:</p> <p>Engineering design and construction of a cover placed over the fine PK deposited within the Fine PK Facility. Engineering design and construction of a cover placed on the PK facilities.</p> <p>The conformity table submitted by De Beers reads: Engineering design and construction of a cover placed over the coarse PK deposited within the Coarse PK Facility</p>	<p>De Beers committed to including the following phrase on October 26, 2017: Engineering design and construction of a cover placed over the fine PK deposited within the Fine PK Facility. Engineering design and construction of a cover placed over the coarse PK deposited within the Coarse PK Facility.</p> <p>There are inconsistencies in the description of Primary Reclamation Activities.</p> <p>Board directs De Beers to ensure its next conformity table and iteration of ICRP are consistent and that De Beers reflect wording commitments for SW1 Activities as committed to on October 26, 2017.</p>	Wording is revised in Table 21 (formerly 20) for the primary reclamation activities of SW1 to reflect De Beers commitments.
SW2 – Drainage pathways for surface runoff are physically stable.	N/A	Final grading where required to promote positive drainage. Drainage pathways (e.g., spillway at the Fine PKC Facility) will be established as per design and QA/QC. QA/QC protocol completed by a professional engineer.	<p>On November 25, 2016, De Beers committed to update SW2 Activities to clarify that “drainage pathways will reflect pre-disturbance conditions where feasible.”</p> <p>This update was missed during the review of Closure Options and Activities. Board directs De Beers to include these edits of ICRP V.4.1.</p>	Wording is revised in Table 21 (formerly 20) for the primary reclamation activities of SW2 to reflect De Beers commitments.
	<p>On September 14, 2017, the Board required the following:</p> <ul style="list-style-type: none"> Options analysis of final plans for site wide drainage pathways; Conceptual plans for drainage from the waste rock piles, PK piles, and general site wide drainage requirements; If conceptual plans are not yet completed, details from the Operational Management Plan should be summarized or referenced with regards to potential future water management options at closure and how they might apply to final site conditions. 	N/A	<p>On May 14, 2018, De Beers indicated that options analysis of final plans for site wide drainage pathways and conceptual plans for drainage from waste piles, PK piles and general site wide drainage will be done as part of the RRP in Section 3. These tasks are not reflected in the description of Physical Stability of Engineered Covers in Section 3 of the RRP in ICRP V.4. Additionally, this section of the RRP applies only to PK facilities and will not address the site-wide Objective.</p> <p>Board directs De Beers to clarify how, when and why site-wide drainage pathways will be identified (description of options and chosen activity).</p> <p>Section 3 of the RRP is expected to be completed by the end of 2022 but the cover for the Fine PKC Facility will be complete by then (according to Figure 40 of the ICRP).</p> <p>Board directs De Beers to clarify how the timing of these activities will work for closure: How will results from Section 3 of the RRP inform the final design of the Fine PKC cover if research is not complete?</p> <p>De Beers did not respond to the Board’s request to summarize how the Operational Management Plan might help identify future water management options at closure.</p> <p>Board directs De Beers to summarize how the Operational Management Plan might help identify future water management options at closure.</p>	<p>Site wide drainage pathways is presented in the final landform design included as part of the FCRP, and is informed by the operational monitoring and any adaptive management. This statement is added to the reclamation activities column of Table 21 (formerly 20) for SW2. Research is focused on cover design of the mine PK facilities. We do not feel it is necessary for other mine components.</p> <p>Figures 36 (formerly 32) and 44 (formerly 40) within the ICRP, and Figure E.1 within the RRP is revised to reflect changes in the mine schedule. Geotechnical investigations will inform cover design for the Fine PK Facility. The investigations will continue following closure of the Fine PK Facility to support the cover design for the Coarse PK Pile. With the initiation of rock cover construction at the Coarse PK Pile in 2026, the geotechnical investigation is considered fully completed. Wording has been adjusted for clarification regarding these timelines in RRP Section 3.1.3 Task 2.</p> <p>As stated in Section 5.2.9.2 of the ICRP, drainage pathways at closure is informed by the Operational Water Management Plan. The Operational plan will provide a working knowledge of preferred water drainage direction and options. Text in Section 5.2.9.2 is revised to reflect this as well as specify the monitoring and adaptive management aspect of the operational plan which will feed into the development of the Closure Water Management Plan.</p> <p>A more detailed description of how the operational plans will impact closure plans has been added to ICRP Section 5.2.9, specifically, how triggers is documented in the ACRPPR, implications for closure assessed, and appropriate changes made in the ICRP update and final plans.</p>
SW3 – Surface runoff and seepage water quality that is safe for people, vegetation, aquatic life, and wildlife.	<p>On September 14, 2017, the Board required the following:</p> <ul style="list-style-type: none"> PAG rock management & Water Management Pond: Alternatives of assessed and the benefits of the chosen activity during EIA should be provided for context. 	Characterization and management of PAG rock during operations will occur as per the approved management plans (De Beers, 2016b, 2015e)...	<p>De Beers did not provide information or a reference to where information leading to decisions on how the development of the Water Management Pond was decided. A quick review of the original WL Application provides some information on alternatives considered by De Beers for construction of the Water Management Pond.</p> <p>Board directs De Beers to include alternatives to the Water Management Pond that were previously assessed and the benefits of the chosen activity in ICRP V.4.1.</p> <p>On November 25, 2016, De Beers committed to including PAG management options that will be considered by De Beers into Section 4.4.1.2 of the Project Alternatives - Waste Management Streams.</p> <p>Board directs De Beers to include PAG management options in Section 4.4.1.2 and Table 20, where appropriate for SW3 and MR3.</p>	<p>Alternatives assessed for the Water Management Pond, as described in the Detailed Alternatives Analysis, have been added to ICRP Section 4.4.1.3.</p> <p>The disposal strategy for PAG rock is added to Section 4.4.1.2, however, no alternative options were considered for these methods. It should be noted the current PAG disposal method was reviewed and approved during the Water Licence application and amendment process. Text is added to primary reclamation activities of MR3 in Table 21 (formerly 20) to include deposition of PAG rock within the open pits and interior dykes for consistency with the disposal strategy described in Section 4.4.1.2. Further description of PAG rock management is provided in Section 5.2.5.3.</p>
SW5 – Safe passage and use for Caribou and other wildlife.	N/A	“...Mitigation of environmental risk to wildlife from soil, sediment or water will be completed as required based on the applicable closure criteria for environmental media...”	Board directs De Beers to identify what objectives and criteria they are referring to here.	Text is adjusted for primary reclamation activities of SW5 in Table 21 (formerly 20) to specify closure objectives SW3, KL1 and I1 as the source of closure criteria for environmental media.

	<p>On September 14, 2017, the Board required the following:</p> <ul style="list-style-type: none"> • A summary of alternatives assessed during EIA; • De Beers description of cover options provided May 5, 2017; • Benefits of the chosen activity to meet objective SW5. 	<p>Removal of all buildings, equipment, and surface hazards. A final grading/contouring plan will be developed for each Mine Rock Pile and PK facility, as well as, a plan that addresses the remainder of the Mine outside these facilities. Re-contouring of surface materials to reduce ground hazards and reflect surrounding topography where possible. Where applicable, final site grading/contouring will be informed by operational wildlife monitoring. Engineered earthen structures remaining at the site (i.e. Mine Rock Piles, Fine PK Facility and Coarse PK Pile) will be physically stable. See MR and PK closure objectives below for details specific to stability of mine waste areas... ...Monitoring of landform reclamation efforts will include assessment of habitat improvement.</p>	<p>A reference to the EIS or a summary of its analysis has not been included in the ICRP, as requested by the Board. Board directs De Beers to include a summary of alternatives assessed for ensuring the safe passage and use of the site during the EIA. On May 5, 2017, De Beers provided information on cover closure options by component. This information applies also to PK and MR objectives and options. Board directs De Beers to repeat the level of detail provided on May 5, 2017 in the ICRP V.4.1, where applicable.</p>	<p>As noted in the May 14, 2018 response, alternative analysis specific to SW5 was not addressed as a specific item within the EIA, however many environmental design features and mitigation measures are outlined in Table 7.4-1 in Section 7_Caribou of the EIA. Reference to this table is added to the reclamation activities column of Table 21 (formerly 20) for SW5. Details from the May 5 response is added as part of the options assessment for cover design in the RRP, Section 3.1.3 Task 1. In addition, the Table 3 from the May 5, 2017 response is added to Section 5.2.4 of the ICRP V4.1 as Table 22.</p>
PK1 – Prevent PK from entering the surrounding terrestrial environment.	<p>On September 14, 2017, the Board directed De Beers to include any changes or updates to the ICRP as a result of the Fine PKC Facility expansion in V.4 or future iteration of the ICRP, when required. If no change, acknowledgement of such should be provided with an explanation.</p>	<p>Section 5.2.6 states: Currently the Mine is in the late stages of construction and still transitioning into ore extraction and processing activities. Although some updates to the mine plan and assessment were completed in 2012 (De Beers, 2012c), no significant changes to the initial Mine Plan have occurred at this time, and the impact assessment presented in the EIS (De Beers, 2010b) does not require any revisions based on new or updated information.</p>	<p>This update is not reflected in ICRP V.4. Board directs De Beers to update or verify Section 5.2.6 based on recent mine plan changes.</p>	<p>No changes to predicted residual impacts expected. Design details throughout the ICRP V4.1 is updated to the current mine plan and design documents available. Fine PKC Facility design as presented in the ICRP is considered up to date with regards to the expansion. Reference to the most recent UPD in regards to the Fine PKC Facility expansion is added to Section 5.2.6.</p>
	<p>On September 14, 2017, the Board directed De Beers to include all options outlined in De Beers' responses to reviewer comments into the V.4 of the ICRP, where applicable.</p>	N/A	<p>On May 5, 2017, De Beers committed to including Table 3: Summary of Closure Options by Facility into Section 5.2.4 of the ICRP V.4. This has not been done. This information applies also to OP1, KL3, MR1, and I3 Objectives and Options. Board directs De Beers to include Table 3: Summary of Closure Options by Facility into Section 5.2.4 of the ICRP.</p>	<p>Table 3: Summary of Closure Options is added to Section 5.2.4 of the ICRP 4.1 as Table 22.</p>
PK3 – Chemically stable Processed Kimberlite Facilities (piles) that do not endanger human, wildlife, or environmental health and safety.	<p>On September 14, 2017, the Board required the following:</p> <ul style="list-style-type: none"> • A summary of alternatives assessed in the design of PK management facilities/options during EIA and the benefits of the chosen activity; • A summary of how current PK facility designs considered the chemical stability aspects and how the chosen activities benefit PK3 over alternatives. 	<p>Construction of the PK facilities will be in accordance with the approved designs and constructed using non-PAG material.</p>	<p>On May 14, 2018, De Beers indicated that no alternative analysis was completed for the PK facilities during the EIA. A quick review of the MVEIRB Report of EIR suggests that alternatives for chemical stability were addressed. Board directs De Beers to include any information regarding alternatives and benefits of the chosen PK facility design in ICRP V.4.1 where appropriate.</p>	<p>Details on the alternative options considered for disposal of fine PK and adjustment to the Fine PKC Facility design is added to Section 4.4.1.2.</p>
KL1 – Return Kennady Lake to a state that will support a functioning aquatic ecosystem and traditional uses.	<p>On September 14, 2017, the Board required the following:</p> <ul style="list-style-type: none"> • Reference the sequential mining of pits and its advantages on refilling Kennady Lake from De Beers' <i>Detailed Alternative Analysis Report</i> (2012) 	N/A	<p>On May 14, 2018, De Beers claimed that there was no information in its Detailed Alternative Analysis Report (DAAR) specifically regarding the sequential mining of pits. Section 2.3 of the DAAR provides some information on the sequential mining, for example it identifies "the opportunity to use the pits to passively sequester other substances such as saline groundwater is also important." Board directs De Beers to include information from any source regarding the sequential mining of pits and its advantages on refilling Kennady Lake in ICRP V.4.1.</p>	<p>Information regarding sequential mining of open pits from the DAAR is added to Section 4.4.1.1 of the ICRP.</p>

<p>KL2 – Physically stable constructed banks of Kennady Lake to limit risk of failure that would impact aquatic life, wildlife, and people.</p>	<p>N/A</p>	<p>Banks constructed within Kennady Lake (e.g., interface of lake and mine rock piles) will be physically stable. Aquatic biota, and the characteristics of Kennady Lake (i.e., riparian habitat) is addressed in Objective KL1 (which reads: Construction of fish habitat as per DFO Authorization).</p>	<p>On November 25, 2016, De Beers committed to add a statement to the Primary Reclamation Activities column in Table 20 to include “Implementation of the Revegetation plan for Kennady Lake as developed through Task 3 of the RRP Section 2.1” Instead, the activities refer back to KL1. Riparian habitat along the banks of the Lake (e.g., interface of lake and mine rock piles) is not clearly addressed in KL1. If riparian habitat compensation for the whole of Kennady Lake is included in the DFO authorization, more detail in Table 20 will allow reviewers to understand how De Beers’ fish habitat activities will achieve these two objectives. If revegetation is required to ensure bank stability, then a link to the Revegetation Research Plan, which includes riparian revegetation, is required, as formerly committed to by De Beers. These adjustments will help to strengthen and clarify the linkages between the research, the reclamation activity, the criteria and the objectives related to Revegetation, as De Beers pointed out.</p> <p>De Beers also committed to providing a complete list of all “constructed banks” identified in KL2 (e.g., interface of lake and mine rock piles). This has not been done.</p> <p>Board directs De Beers to include a complete list of all “constructed banks” identified in KL2 in ICRP V.4.1.</p> <p>Board directs De Beers to include references to RRP Section 2.1 in Table 20 of the ICRP as committed to on November 25, 2016.</p>	<p>Constructed banks is marked in Figure 40 and reference to the figure added to the Reclamation Activities column for KL2 in Table 21 (formerly Table 20).</p> <p>Revegetation is not considered to be a design requirement for bank stability, thus the reference back to KL1 for biota characteristics is left as valid and no reference to RRP Section 2.1 is needed.</p> <p>The statement specifying the implementation of the revegetation plan for Kennady Lake is added to the Reclamation Activities for KL1.</p> <p>Reference to the aquatic revegetation research component of RRP Section 5.1, as well as the riparian revegetation research component of RRP Section 2.1 is added to the Reclamation Research column of Table 20 for KL1.</p>
<p>KL3 - Kennady Lake is reconnected with the upstream and downstream and small craft navigation is possible within the Kennady Lake basin through the dyke and pit areas.</p>	<p>N/A</p>	<p>The downstream slope of Dykes B, J, N, and K will be flattened and covered with a 1 m thick erosion protection material layer (2028). Dykes B, N, and K will be partially breached to a final crest elevation of 417.0 masl (2029), then completely breached, along with the entirety of Dyke J, to 418 masl.</p>	<p>This description of closure activity is not clear to the Board.</p> <p>Board directs De Beers to consider rephrasing this activity for clarity. How are dykes completely breached to a level higher than the partial breach, or is Dyke J the only dyke to reach only 418 masl?</p>	<p>Wording is revised for clarity in Table 21 (formerly 20) for KL3 reclamation activities. Each dyke is lowered to 418 masl, and only B, N and K are breached to 417 masl.</p>
	<p>On September 14, 2017, the Board directed De Beers to include a reference to the Flow Mitigation Plan and a summary of stream habitat restoration alternatives, as referenced in the De Beers’ Detailed Alternative Analysis Report (2012).</p>	<p>N/A</p>	<p>Information and references from De Beers’ Detailed Alternative Analysis Report (De Beers, 2012c) have not been summarized or provided for KL3 options in ICRP V.4.</p> <p>Board directs De Beers to include a summary of stream habitat restoration alternatives, as referenced in the De Beers’ Detailed Alternative Analysis Report for KL3 options in ICRP V.4.</p>	<p>Summary of the alternatives analysis for the refilling and restoration of Kennady Lake is provided in Section 4.4.1.4 of the ICRP. No full alternatives analysis for the restoration of stream habitat is provided in De Beers’ Detailed Alternative Analysis Report (De Beers, 2012c), however the EIS’ Conceptual Compensation Plan (CCP) is referenced and its options for fish habitat compensation summarized. A summary of the fish habitat compensation options as considered in the CCP and summarized in the DAAR has been added within Section 4.4.1.5.</p>
<p>I2 – Re-vegetation targeted to priority areas.</p>	<p>N/A</p>	<p>The conformity Table submitted with ICRP V.4 on May 14, 2018 identified the following for closure activities associated with I2:</p> <ul style="list-style-type: none"> • Grading surfaces to promote drainage and limit pooling, surface material loosening (scarification); • Placement of salvaged overburden and lake sediments as a growth amendment to priority locations; • Application of native species; and, • Additional activities will be determined by research findings at the revegetation test plots. <p>Table 20 of ICRP V.4 provides the following Primary Reclamation Activities for I2 and former SW5:</p> <p>I2 - Available surface materials will be salvaged and applied as a growth substrate; compacted soil surfaces (e.g., roads, pads) will be scarified; and native species will be applied to priority areas. As informed by the research, a revegetation plan for the site will be</p>	<p>Board directs De Beers to consolidate the activities from former Objective SW5 with Objective I2 in ICRP V.4.1.</p>	<p>Former Objective SW5 was a relic from previous report versions. Objective is removed from ICRP V4.1. Activities from former Objective SW5 have been consolidated with Objective I2 in Table 21 (formerly 20).</p>

I3 – Disturbed areas will be safe for people, wildlife, and vegetation.	N/A	<p>The conformity Table submitted with ICRP V.4 on May 14, 2018 identified the following for closure activities associated with I3:</p> <ul style="list-style-type: none"> • Removal of all buildings, equipment, and surface hazards. • Final grading will reflect surrounding topography and re- establish natural drainage pathways where possible. • Application of native vegetation <p>Table 20 of ICRP V.4 provides the following Primary Reclamation Activities for I3 and former SW7:</p> <p>I3 - ... A final plan for grading/contouring the site, that incorporates the removal of all buildings, equipment and non-local materials on the surface, will be developed. No visible buildings, equipment or non-local materials on surface. Final grading reflects surrounding topography and re- establish natural drainage pathways where possible; native vegetation</p>	Board directs De Beers to consolidate the activities from former Objective SW7 with Objective I3 in ICRP V.4.1.	Former Objective SW7 was a relic from previous report versions. Objective is removed from ICRP V4.1. Activities from former Objective SW7 have been consolidated with Objective I3 in Table 21 (formerly 20).
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Table 4: Inconsistencies - Closure Criteria

Objective	Criteria in De Beers' Conformity Table	Criteria in ICRP V.4	Comments	Response
SW1 – Air quality levels safe for people, vegetation, aquatic life and wildlife.	<p>Ambient air quality shall not exceed the NWT Ambient Air Quality Standards for total suspended particulate (TSP), fine Particulate Matter (PM 2.5), and Nitrogen Dioxide (NO2). As of September 2017: Annual NO2 – 60 µg/m3, 24 hour TSP - 120 µg/m3, Annual TSP – 60 µg/m3, 24-hour PM2.5 – 28 µg/m3.</p> <p>Site-specific criteria may be developed if site- specific factors differ from what was assumed for the generic guideline values therefore affecting the applicability of the generic criteria.</p>	<p>Closure air quality criteria will be developed using territorial/federal guidelines or site-specific risk-based criteria.</p> <p>Final engineering design of the closure landform features will inform the need to develop site specific criteria.</p>	<p>NWT Air Quality Standards have not been included in Table 20 of ICRP V.4.</p> <p>Board directs De Beers to include the NWT Ambient Air Quality Standards as committed to on November 25, 2016 and October 26, 2017.</p>	SW1 criteria is updated to reflect criteria proposed in De Beers' conformity table.
OP1 - The backfilled and/or flooded pits will not adversely impact establishment and/or maintenance of sustainable aquatic ecosystems and life in the overlying Kennady Lake and downstream waterbodies.	<p>Water and sediment quality in the flooded/backfilled pits will not adversely affect Kennady Lake water quality such that it prevents re- establishment of the aquatic ecosystem in Kennady Lake.</p> <p>Establishment and maintenance of meromictic conditions within the flooded Tuzo pit.</p> <p>Additional criteria may be developed in the Final Closure Plan consistent with the outcomes of the reclamation research program.</p>	<p>Water and sediment quality in the flooded/backfilled pits will not adversely affect Kennady Lake water quality such that it prevents re- establishment of the aquatic ecosystem in Kennady Lake.</p> <p>Establishment of meromictic conditions within the flooded Tuzo pit.</p> <p>Additional criteria may be developed in the Final Closure Plan consistent with the outcomes of the reclamation research program.</p>	<p>On November 25, 2016, De Beers committed to change the wording in OP1 criteria to reflect reviewer comments on the need to not only establish certain conditions, but to maintain certain conditions related to OP1. De Beers agreed to update criteria as follows:</p> <p>Water and sediment quality in the flooded backfilled pits will not adversely affect Kennady Lake water quality such that it prevents re- establishment <i>and/or maintenance</i> of the aquatic ecosystem in Kennady Lake.</p> <p>Establishment <i>and maintenance</i> of meromictic conditions within the flooded Tuzo pit.</p> <p>The conformance table submitted with ICRP V.4 and the Updated Table 20 provided on October 26, 2017 reflect the commitment to include "...maintenance of meromictic conditions" but the ICRP V.4 does not. The commitment for the "...maintenance of the aquatic ecosystem" was missed during the review of closure criteria. De Beers have not provided any rationale for removing the edits it committed to on November 25, 2016.</p> <p>Board directs De Beers to include the wording of OP1 criteria as committed to on November 25, 2016.</p>	The phrase "and maintenance" has been reinserted into the closure criteria. Additional text has been added to constrain the timeframe of maintenance to the establishment of a stable aquatic ecosystem and chemocline.
KL2 – Physically stable constructed banks of Kennady Lake to limit risk of failure that would impact aquatic life, wildlife, and people.	<p>No significant deformation and degradation, erosion or sedimentation indicated at constructed banks, confirmed by visual monitoring as part of site geotechnical inspections completed by a professional engineer.</p> <p>Constructed banks conform to the final design as determined by the engineer of record.</p>	<p>No significant deformation, degradation, erosion or sedimentation indicated at constructed banks, confirmed by visual monitoring as part of site geotechnical inspections completed by a professional engineer.</p> <p>Criteria, in addition to visual inspection, to be refined based on final engineering design.</p>	<p>De Beers' updated Table 20, provided to the Board on October 26, 2017, includes "Constructed banks conform to the final design as determined by the engineer of record." This statement is not part of the criteria provided in Table 20 of ICRP V.4.</p> <p>Board directs De Beers to include the wording for criteria KL2 as committed to on October 26, 2017.</p>	Wording for KL2 criteria is amended to reflect De Beers' commitments.

Table 5: Missing Information - Closure Criteria and Post-Closure Monitoring

Objective	ICRP V.4		Comments	Response
<p>SW1 – Air quality levels safe for people, vegetation, aquatic life and wildlife.</p>	<p>Table 20 Monitoring: Air quality monitoring for suspended particulates will be completed <i>during the summer for three years post- closure e...</i></p> <p>Table 20 Research: ...required cover thickness and material <i>in order to achieve the post- closure air quality objectives .</i></p> <p>Section 5.2.8.1 - Post Closure Monitoring: from active closure (commence 2029) until closure criteria are achieved and a performance assessment report will be accepted.</p> <p>Table 21 – Particulate monitoring <i>during refilling of Kennady Lake, as required (End-of-Mining, Kennady Lake Refilling Monitoring Phase: Year 12 (2028) through Year 23 (2039)).</i></p>		<p>The timeframes suggested for post-closure monitoring of air quality are not consistent in ICRP V.4. This may also be true for other mine components.</p> <p>Board directs De Beers to maintain consistency throughout ICRP V.4.1.</p>	<p>Timeframes is removed from the post-closure monitoring column in Table 21 (formerly 20), and adjusted throughout Section 5.2.8.1 for consistency.</p> <p>Figure 44 (formerly 40) has also been revised for consistency with post-closure monitoring schedules.</p>
<p>SW2 – Drainage pathways for surface runoff are physically stable</p>	<p>Table 20 Criteria such as: No significant signs of deformation, degradation and/or erosion and sedimentation which could contribute to physically unstable conditions <i>as visually observed during geotechnical inspections by a qualified professional engineer on a minimum of two geotechnical inspections occurring over a duration of at least two years;</i> <i>No visual indications of significant deformation and degradation observed during a final inspection by a professional engineer.</i></p> <p>Similar wording for criteria is noted for Objectives SW4, OP2, KL2, MR1, and PK1.</p>		<p>On February 13, 2018, the Board directed De Beers to reflect additional information with details on the risk profile for geotechnical inspections and associated instrumentation beyond visual inspection in V.4 of the ICRP. This applies to any mine component (dykes, drainage pathways, open pits, PK area, mine rock piles, etc.) that requires geotechnical inspection. This has not been done.</p> <p>On May 14, 2018, De Beers stated that “slope monitoring includes a hierarchal system of controls from visual inspections, prism monitoring, and laser scanning to radar and subsurface monitoring using borehole instruments. These programs are designed to detect any areas of increased hazard due to rockfall potential, evidence of movement, crack propagation, or changes in slope. Monitoring during backfilling will include the same set of programs to ensure the pits remain safe for workers.”</p> <p>Board directs De Beers to include more detail to all applicable sections of ICRP V.4.1 where ‘visual’ inspections are identified for determining final site closure conditions. All components of visual and instrumentation inspection that may be required should be listed for reviewers and the Board to consider.</p>	<p>It is the duty and responsibility of the engineer to confirm stability of mine components. Their signed off inspection is considered sufficient criteria to confirm an objective for physical stability is met. The final engineering designs will include a monitoring program to be executed post-closure that includes these geotechnical inspections.</p> <p>A summary of general items looked at during geotechnical inspections has been added to the criteria where visual inspections are specified. See ICRP Section 5.2.3 Table 21 - SW2, SW4, MR1, PK1, PK2.</p>
<p>SW3 – Surface runoff and seepage water quality that is safe for people, vegetation, aquatic life, and wildlife.</p>	<p>Table 20 Criteria: Closure water quality that meets territorial/federal guidelines and/or site- specific risk-based criteria to be specified in the Final Closure Plan;</p> <p><i>Final engineering design will inform the need to develop site specific criteria.</i></p> <p>Similar wording for criteria is noted for Objectives SW1, SW2, SW4, SW5, OP1, OP2, KL2, MR1, PK1, PK2, and I2.</p>		<p>De Beers depends on the completion of various engineering design reports and reclamation research results before it will commit to developing measurable criteria.</p> <p>Board directs De Beers to provide more information on how final engineering designs will inform criteria, wherever applicable, and provide a clear timeline for the expectation of these reports or results.</p>	<p>Final designs will establish final condition of site, and any specific criteria is developed at that time to reflect site conditions. Final designs is included with the FCRP (per Part J item 5 of WL). Reclamation research results and operational monitoring is used to inform final designs and set criteria. A statement clarifying this has been added to ICRP Section 5.2.3. The level of detail of the criteria the Board desires will not be possible until final designs are well advanced/complete.</p> <p>Text is added to Table 21 (formerly 20) criteria for SW2, stating "the closure water management plan will consider site drainage and landforms at site, and is a key plan to inform what criteria may be achievable."</p>

	<p>Table 20 Monitoring: Water quality monitoring (runoff and seepage at locations of concern across the site);</p> <p>Aquatic and Wildlife Effects monitoring (<i>select receptors which are present at the site following reclamation</i>).</p> <p>Thermal monitoring will be completed in each Mine Rock Pile and PK facilities.</p>		<p>On February 13, 2018, the Board noted De Beers' commitment to refine aquatic and wildlife post-closure monitoring details in the FCRP and directed De Beers to include a statement to clarify and reflect this commitment in V.4 of ICRP. The Board also directed De Beers to reflect post-closure thermal monitoring details in the ICRP. Nothing about De Beers' commitment to refine aquatic and wildlife post-closure monitoring details in the FCRP or information on the duration of post-closure thermal monitoring was provided in Section 5.2.8 of ICRP V.4.</p> <p>Board directs De Beers to explain its commitments to refine aquatic and wildlife post-closure monitoring details in the FCRP, wherever appropriate.</p> <p>Board directs De Beers to provide more information on the frequency and duration of post-closure thermal monitoring.</p>	<p>In Section 5.2.8.1, it is noted the scope, duration and frequency of post-closure monitoring is refined and developed for a detailed post-closure monitoring plan to be included in the FCRP. This is considered to include details of the aquatic, wildlife and thermal post-closure monitoring and thus satisfy the requirement for a statement explaining post-closure monitoring details is refined in the FCRP, as well as provide all necessary information on frequency/duration of post-closure thermal monitoring at this time. The aquatic, wildlife, geotechnical, thermal programs have been added as examples to this section.</p> <p>In addition, wildlife, aquatic, geotechnical and thermal monitoring is listed in Table 21 (formerly 20) to be conducted as part of post closure monitoring, and is also stated in some sections that the programs is adjusted or refined for post closure conditions or defined in the final closure plan.</p> <p>No change considered necessary to the ICRP.</p>
			<p>On August 7, 2018, reviewers suggested that, if explicit numbers for criteria cannot be set at this time to measure water quality or physical stability objectives, at least the components that will be measured could be identified as part of the closure criteria.</p> <p>Board directs De Beers to identify all components of the receiving environment that will be subject to monitoring to confirm criteria are met (once set) under each objective. This direction is not exclusive to SW3.</p>	<p>The existing SNP and AEMP programs are adequate to confirm criteria. Wording is added to SW3 to address that the SNP and AEMP is adjusted for post closure to provide the assessment of closure criteria.</p> <p>The level of detail for specific parameters are not known at this time. The final AEMP and SNP programs will establish the parameters, and is provided with the FCRP.</p> <p>However, additional detail explaining the operational monitoring programs is adjusted for final closure, and will inform the closure receptors that is looked at to assess criteria, has been added to each objective where appropriate, and examples provided of potential specific receptors that may be monitored (e.g. fish health, embankment settlement, caribou, etc.). See ICRP Section 5.2.3 Table 21 - SW2, SW3, SW4, SW5, SW6, KL1, KL2, MR1, PK1, PK2, I2.</p>
<p>SW4 – Mine areas are physically stable for use by people and wildlife.</p> <p>and</p>	<p>Table 21 – Wildlife effects monitoring <i>Throughout mining and refilling of Kennady Lake, up to 5 years post refilling (End-of- Mining, Kennady Lake Refilling Monitoring Phase: Year 12 (2028) through Year 23 (2039))</i> .</p>		<p>The timeframes suggested for post-closure monitoring of wildlife effects are not consistent in ICRP V.4. This may also be true for other mine components.</p> <p>Board directs De Beers to maintain consistency throughout ICRP V.4.1.</p>	<p>Refer to Line 59 response.</p>
<p>SW5 – Safe passage and use for Caribou and other wildlife.</p>	<p>Section 5.2.8.1 - Post Closure Monitoring: from active closure (commence 2029) until closure criteria are achieved and a performance assessment report will be</p> <p>Table 20 Monitoring: <i>Monitoring timeframe will be informed by RRP and included in FCRP.</i></p> <p>Table 20 Criteria: Use of the site by wildlife (i.e. birds, mammals) <i>as documented through a minimum of two years of post-closure monitoring</i> .</p> <p>Similar wording for criteria is noted for Objectives SW1, SW3, OP1, OP2, KL1, KL2, KL3, MR1, and MR2.</p>		<p>Throughout the review of the ICRP, reviewers have expressed concern with the timelines for post-closure monitoring for most objectives.</p> <p>On February 13, 2018, the Board directed De Beers to update the RRP to include research on an appropriate post-closure monitoring time frame in evaluation of wildlife use. On May 14, 2018, De Beers stated that they are of the opinion that post-closure monitoring timeframes for the evaluation of wildlife use are not necessary at this time and the development of such has not been included as tasks or goals in the RRP.</p> <p>Board directs De Beers to explain how monitoring timeframes for wildlife monitoring will be informed by the RRP if it is not identified as a task or goal of the RRP.</p> <p>Board also requires De Beers to provide references to existing wildlife monitoring programs with a summary to provide context in either the ICRP or RRP (wherever is most appropriate) to better define what post-closure wildlife monitoring might look like.</p>	<p>The RRP does not include a task for wildlife monitoring and will not be used to inform timeframes for post-closure wildlife monitoring. Operational wildlife monitoring programs is adjusted for post closure based on the closure criteria and appropriate timeframe to assess their achievement. Detail regarding the adjustment of operational programs for post closure has been added to ICRP Section 5.2.3 Table 21 (formerly 20) - SW5, with examples provided for the potential receptors that may be monitored. Further reference to and details on the Mine's operational Wildlife Effects Monitoring Program (WEMP) and Wildlife and Wildlife Habitat Protection Plan (WWHPP) are provided in Section 3.4.3. As noted in Section 5.2.8.1, determination of the scope, duration and frequency of various post-closure monitoring efforts is informed by the various monitoring programs executed during mining and into closure.</p> <p>The statement in Table 21 (formerly 20) SW4 refers to the monitoring timeframe for physical stability, and is adjusted to clarify this.</p>
			<p>There may be a potential conflict between criteria stating "a minimum of two years of post-closure monitoring" and De Beers commitment in Section 5.2.8.1 to monitor mine components from active closure (commence 2029) until closure criteria are achieved. The two year minimum in the criteria will arguably allow for criteria to be met within that time whether or not the two years of monitoring is sufficient to determine that the closure objective will be met. As many reviewers noted on August 7, 2018, two years of monitoring will not allow for the observance of natural variability of most environmental receptors (water quantity, wildlife use, etc.). The phrasing of the criteria with the two year minimum could, effectively, be self-fulfilling, regardless of monitoring results and commitments in 5.2.8.1.</p> <p>Board directs De Beers to remove all references to "a minimum of two years of post-closure monitoring" from its closure criteria. Board directs De Beers to commit to post-closure monitoring for a minimum of two years and until the objective will be met and a performance assessment report will be accepted.</p>	<p>Timeframes for post-closure monitoring is removed from all closure criteria in Table 20. Monitoring timeframes to verify the objective is met is specified in the final design plans. This detail has been added to Section 5.2.8.1.</p>
<p>OP1 - The backfilled and/or flooded pits will not adversely impact establishment and/or maintenance of sustainable aquatic ecosystems and life in the overlying Kennady Lake and downstream waterbodies.</p>	<p>Table 20 Criteria: Additional criteria <i>may</i> be developed in the Final Closure Plan consistent with the outcomes of the reclamation research program.</p>		<p>The criteria written by De Beers allow for future updates as a result of the outcomes of RRP. During the review of ICRP V.3 on November 10, 2016, Board staff noted that De Beers should ensure that Research Plans are designed to actually inform closure objectives and criteria (not 'may'). In fact, Task 4 of RRP Section 4.1 and Task 5 of RRP Section 5.1, both linked to Objective OP1 include the development of measurable or numerical closure criteria.</p> <p>The use of 'may' is used again in the RRP: "The completed research <i>may</i> inform the objectives and criteria of future versions of the closure and reclamation plan." De Beers should be confident that the results of all reclamation research will inform final closure.</p> <p>Board directs De Beers to replace the use of 'may' with 'will' to improve reviewer and Board confidence in the design and implementation of RRP for informing closure conditions at Gahcho Kue.</p>	<p>The term 'may' is replaced with 'will' in the locations noted by the reviewer (ICRP Table 20 criteria for OP1, and RRP Section 2.1).</p>

<p>OP2 – Physically stable pit walls to limit risk of a failure impacting people and aquatic life.</p> <p>and</p> <p>KL2 – Physically stable constructed banks of Kennady Lake to limit risk of failure that would impact aquatic life, wildlife, and people.</p>	<p>Table 20 Monitoring: OP2 - Area inspected and as-built drawing is deemed acceptable and signed-off by a professional engineer.</p>		<p>On November 25, 2016 De Beers committed to updating Table 20 to reflect reviewer comments regarding the need for a risk assessment to identify acceptable risk and to demonstrate that risks are limited as outlined in the Objective:</p> <p>“A risk assessment will be added to the post-closure inspections and/or Monitoring column of Table 20 for OP2.”</p>	<p>A risk assessment is added to the post-closure inspections and/or monitoring column of Table 20 for OP2 and KL2 in ICRP V4.1.</p>
	<p>Table 20 Monitoring: KL2 - Geotechnical inspections (visual) of the site will occur post closure in concert with the site geotechnical inspection and monitoring program...</p>		<p>This has not been done.</p> <p>Board directs De Beers to include a risk assessment to the post-closure inspections and/or monitoring column of Table 20 for OP2 and KL2 in ICRP V.4.1.</p>	
<p>KL1 - Return Kennady Lake to a state that will support a functioning aquatic ecosystem and traditional uses.</p>	<p>Table 20 Criteria: Complete all agreed upon fish habitat compensation in accordance with DFO authorization(s);</p> <p>Water quality that meets territorial/federal (Health Canada’s <i>Guidelines for Canadian Drinking Water Quality</i> (August 2012 edition or most recent version) or site-specific risk-based criteria for use as a source of drinking water. Criteria linked to health-based targets, not aesthetic;</p> <p>Sediment quality that meets territorial/federal guidelines or site-specific risk based criteria for sediment;</p> <p>The return of lake trout, northern pike and arctic grayling to Kennady Lake documented through <i>a minimum of two years of monitoring</i> ;</p> <p>Aquatic biota monitoring indicates ecosystem recovery is occurring on a trajectory consistent with EIS or updated predictions.</p>		<p>References to the DFO authorization for fish habitat compensation and sediment quality requirements in both the criteria and monitoring for KL1 will be included in response to reviewer comments and Board direction.</p> <p>The establishment of measurable water quality criteria is subject of RRP. It is not clear, however, when or how sediment quality criteria will be identified and/or developed since it is not included as part of the RRP in the way water quality will be.</p> <p>Board directs De Beers to outline when and how specific measureable criteria for sediment quality will be identified and/or developed.</p> <p>Criteria for Objectives MR2, MR3, PK1 and PK3 (The liquid portion (e.g., seepage water) is addressed within objective KL1) are cross-referenced with KL1 but specific water quality criteria or sampling for seepage waters is not being accounted for in KL1 criteria or activities.</p> <p>Board directs De Beers to include water quality criteria and monitoring activities related to seepage waters from mine rock piles and PK facilities into the criteria and monitoring activities of Objective KL1 to ensure the liquid portion of these mine site components are actually captured.</p> <p>There are no criteria identified to measure whether or not traditional uses identified in the Objective can be undertaken successfully.</p> <p>Board directs De Beers to include criteria that will help De Beers confirm whether or not traditional uses identified in the Objective can be undertaken successfully.</p> <p>Throughout the review of the ICRP, reviewers have expressed concern with the timelines for post-closure monitoring for most objectives. The return of fish species and ecosystem recovery success should include proof of long-term sustainability and variability. The EIR states that it is expected to take 60-75 years after the lake is refilled for a self- sustaining ecosystem with a fish population similar to pre-mining conditions to be re-established in Kennady Lake. The minimum two years of monitoring defined in the criteria will arguably allow for criteria to be met within that time whether or not the two years of monitoring is sufficient to determine that the closure objective will be met.</p> <p>Board directs De Beers to remove all references to “a minimum of two years of post-closure monitoring” from its closure criteria. Board directs De Beers to commit to post-closure monitoring for a minimum of two years and until the objective will be met and a performance assessment report will be accepted.</p>	<p>As noted in De Beers' May 14, 2018 response, De Beers is planning to develop final closure criteria for sediment quality in Kennady Lake, including the area that during Operations is the Water Management Pond, as part of the Final Closure Plan. As noted in the ICRP Version 4, Section 5.2.3 “the decision to adopt existing environmental guidelines/standards, develop site-specific criteria using risk assessment, or some combination of the two approaches is made in the future when mining operations are underway, and more is known regarding site conditions based on environmental monitoring data and the performance of mitigation strategies to promote the selection of reclamation standards, which are considered both protective to ecological receptors and achievable.” Therefore, numerical criteria are not proposed at this time.</p> <p>Specification that sediment criteria is developed for the FCRP based on operational monitoring data and mitigation performance has been added to Table 21 (formerly 20) KL1.</p> <p>See response to Line 27.</p> <p>The return of specific fish species and achieving the water quality criteria for Kennady Lake achieves both the objectives for a functioning aquatic ecosystem and traditional uses. No further criteria are considered necessary.</p> <p>See response to Line 72.</p>
	<p>Table 20 Monitoring: Confirmation by DFO that fish habitat compensation requirements will be met;</p> <p>Post-closure water quality and sediment quality monitoring of Kennady Lake;</p> <p>Aquatic biota monitoring within the refilled Kennady Lake to assess recolonization.</p>		<p>On February 13, 2018, the Board directed De Beers to reference the section of the EIS for ecosystem recovery predictions based on aquatic biota in V.4 of the ICRP. Aquatic biota includes aquatic plants, phytoplankton, zooplankton, benthic invertebrates, and fish (EIS Section 8.11). It is unclear how the aquatic biota monitoring will compare with the EIS predictions and which specific aquatic biota goals are required to meet the objective (i.e. species variety, species abundance, etc.). De Beers did not provide this reference.</p> <p>Board directs De Beers to detail the aquatic biota monitoring plan with reference to EIS predictions and provide more information on the constituents of aquatic biota that will be monitored and measured. This can be used to develop more detailed criteria to meet Objective KL1.</p>	<p>It is unclear if the Board is directing De Beers to develop a new monitoring plan. De Beers will work with DFO, the primary authority regarding Fish Habitat, to ensure the monitoring satisfies the requirements of the Fisheries Auhtorization.</p> <p>Detail has been added to Table 21 (formerly 20) post closure monitoring for KL1 detailing the adjustment of the operational aquatic biota monitoring program to be used for post closure monitoring and assessment of criteria. Examples of the specific receptors for monitoring has been provided, and reference added to the EIS predictions for comparison.</p>

<p>MR2 – Contaminated rock and non-hazardous waste disposal areas within piles do not pose an unacceptable risk to aquatic life, people or wildlife.</p>	<p>Table 20 Criteria: Results of a post-closure risk assessment completed by a qualified person indicate that chemical risks at site are consistent, or less than, EIS impact predictions.</p> <p>Similar wording for criteria is noted for Objectives SW5, MR3, and PK3.</p>		<p>On February 13, 2018, the Board directed De Beers to reference the section of the EIS where chemical risk predictions associated with the Mine Rock Piles could be found in V.4 of the ICRP. De Beers did not provide these references.</p> <p>Board directs De Beers to provide, in ICRP V.4.1, the chemical risk predictions from the EIS.</p> <p>The Board also directed De Beers to elaborate on how and when the results of a post-closure risk assessment can be included in the criteria to make it more measurable. De Beers responded that the post-closure risk analysis will inform the FCRP. It is not clear how a post-closure risk assessment can inform measurable criteria for the FCRP which is required two years prior to closure.</p> <p>Board directs De Beers to provide clarity on the timing of post-closure risk assessments and their ability to inform closure planning prior to submission of the FCRP.</p>	<p>Ecological and human health risk assessment predictions, which include chemical risks in their factoring, are provided in Sections 7, 10, 11.11, and 11.12 of the EIS. Reference to Section 10 of the EIS is added to criteria for MR2, MR3 and PK3.</p> <p>Post-closure risk assessment is submitted with the FCRP and proposed criteria for Board review and submittal process. It is recognized there may be further adjustments to the criteria and other elements of the FCRP through the review process. Text specifying the post-closure risk assessment is to be submitted with the FCRP is added to Table 21 (formerly 20) for SW5 reclamation activities column, and Section 5.2.6.</p>
	<p>Table 20 Monitoring: The placement of contaminated rock and non-hazardous waste are documented annually within the Water Licence annual report. Thermal monitoring will be completed using at least three thermistors that will be installed in each Mine Rock Pile.</p> <p>Water quality monitoring of seepage will occur from downgradient water control structures (i.e. sumps and collection ponds).</p>		<p>On November 25, 2016 De Beers committed to updating Table 20 to include the preparation and submission of As Built reports for the mine rock piles in the “Post-Closure Inspection and/or Monitoring column” to confirm that the mine rock piles are performing as expected. This was not done.</p> <p>Board directs De Beers to update Table 20 of the ICRP as committed to on November 25, 2016.</p>	<p>The closure criteria for objective MR1 includes the completion of an as built report for the mine rock piles. The post-closure inspection and/or monitoring column for objective MR1 includes as built drawings signed by an engineer.</p> <p>For MR2 and MR3, yearly as constructed information is provided in the WL Annual Report, as specified in the post-closure inspection/monitoring column. Together with the inclusion of as built in objective MR1, this is considered to satisfy De Beers' commitments. No changes are considered necessary the ICRP.</p>
<p>PK2 – Physically stable PK disposal areas to limit risk of facility failure.</p>	<p>Table 20 Criteria: Geotechnical stability analysis will be completed as part of the detailed design of rock covers by a professional engineer for the Fine PKC Facility and Coarse PK Pile.</p>		<p>This is a post-closure monitoring activity. Criteria should be the results of this analysis that are required to achieve the Objective: What will the engineer base his/her analysis on?</p> <p>Board directs De Beers to outline the components of an engineer's analysis that must be achieved to meet the objective in the closure criteria section. This comment may have application elsewhere in the ICRP.</p>	<p>It is stated in the criteria that the results of the analysis must indicate performance as per design. The components of the engineer's analysis is provided in the Final Engineering Design and incorporated into the FCRP.</p> <p>As per the response in Line 63, the engineer's final signed off analysis/inspection that confirms stability are considered sufficient criteria.</p> <p>A summary of general items looked at during geotechnical inspections has been added to the criteria where visual inspections are specified. See ICRP Section 5.2.3 Table 21 - SW2, SW4, MR1, PK1, PK2.</p>

Table 6: Missing Information - ICRP

Reviewer Comments			Changes or Updates Required	Response
<p>Section 3.1.2.1 - For PM 2.5, the Canada-wide standards will be replaced with the Canadian Ambient Air Quality Standards (CAAQS).</p>			<p>On November 25, 2016, De Beers committed to update Section 3.1.2.1 to indicate that the mine will comply with the applicable NWT standards and the Canadian Ambient Air Quality Standards (CAAQS) for TSP, fine Particulate Matter (PM 2.5), and Nitrogen Dioxide (NO2). This has not been updated in ICRP V.4.</p> <p>Board directs De Beers to update the air quality standards references as committed to on November 25, 2016.</p>	<p>Canada-wide standards is replaced with the Canadian Ambient Air Quality Standards (CAAQS) in Section 3.1.2.1 of the ICRP V4.1.</p>
<p>Provide the storage capacity in the Tuzo Pit and include the anticipated volume of the Water Management Pond at closure at the 99% confidence limit from the modeling to show that there would be sufficient storage capacity inside Tuzo Pit to contain Water Management Pond waters if it is low quality.</p>			<p>On November 25, 2016, De Beers provided the following information in response to reviewer comments: the maximum potential volume of the Water Management Pond at closure is 18.8 million cubic meters (m3). The storage capacity of Tuzo pit at closure is approximately 49.5 million m3, which is greater than the volume of Kennady Lake under pre-Mine conditions (i.e., 38 million m3). This information has not been included in ICRP V.4.</p> <p>Board directs De Beers to include the relative storage capacities of the Water Management Pond and the open pits (once mined) in Section 5.2.5 of the ICRP and describe contingency plans for waters in the Water Management Pond if they are found to be of low quality at closure and need to be stored with reference to relative storage capacities in Section 5.2.9.</p>	<p>The storage capacities of the WMP and Tuzo Pit is added to Section 5.2.5.1.3. Nearly the entire volume of the WMP is transferred to the Tuzo Pit before it is refilled with lake water. Contingencies in the event of observed poor water quality during lake refilling are described in Section 5.2.5.2 and Section 5.2.9. This is considered to address contingencies for poor quality WMP water.</p>
<p>Section 4.4.2.2 - Include correct information regarding the management of PAG waste rock and where PAG waste rock will be placed – Update to include the use of PAG rock in interior dykes, placed below the final elevation of Kennady Lake.</p>			<p>On November 25, 2016, De Beers committed to add a summary of the approved locations for PAG rock placement into Section 4.4.2.2 to provide additional clarity for the reader. This has not been updated in ICRP V.4.</p> <p>Board directs De Beers to include summary of the approved locations for PAG rock placement into Section 4.4.2.2 of ICRP V.4.1.</p>	<p>PAG waste rock management and disposal locations is further described and clarified in both sections 4.4.1.2 and 4.4.2.2.</p>
<p>Section 4.4.2.2 - PAG material will be placed within the Waste Rock storage area. To avoid flushing, PAG waste rock will not be placed either 0.7m below (El. 420.0) or 0.8 m above (El. 421.5m) the ordinary high water mark (assumed to be elevation 420.7m). These distances or elevations in relation to the either 0.7m below or 0.8 m above the ordinary high water mark should be identified in Figure 20 for clarity.</p>			<p>De Beers did not commit to making this change on November 25, 2016 but the Board is of the opinion that the text and associated Figure are not as clear as De Beers seems to think.</p> <p>Board directs De Beers to update Figure 20 to reflect elevation levels according to the request.</p>	<p>Labelling is added to Figure 20 to show PAG free elevation levels.</p>

<p>Section 4.4.2 and 4.4.3 - Tables have inconsistent nomenclature between years as either -2 to 11 or 2015 to 2027.</p>			<p>On November 25, 2016, De Beers committed to update Tables 12 to 16 to calendar years to avoid confusion. This has not been done.</p> <p>Board directs De Beers to update Tables 12 to 16 to calendar years as committed on November 25, 2016.</p>	<p>Tables 12 to 16 is updated to calendar years.</p>
<p>According to Table 15, fine PK will be discharged to Hearne Pit from Year 5 (2021) to end of mine life. Subsequent Section 4.4.2.3.1 states that the fine PK will be discharged to Hearne pit once the pit is mined out at the end of Year 3 (2019). Table 19, p.132 states fine PK will be stored in the fine PK storage facility until Year 6 (2022).</p>			<p>On November 25, 2016, De Beers committed to update the text to ensure there is flexibility regarding the transition period from the Fine PK Facility to Hearne pit and that the inconsistencies identified by the reviewer are corrected.</p> <p>Additionally, cross-references were to be added to the Processed Kimberlite and Mine Rock Management Plan and other documents where additional detail may be found regarding capacities and sequencing at the facilities and pits. This has not been done.</p> <p>Board directs De Beers to update text in the ICRP regarding the transition period of fine PK disposal from the Fine PK Facility to Hearne Pit and provide references to the Processed Kimberlite and Mine Rock Management Plan and other documents where additional detail may be found regarding capacities and sequencing at the facilities and pits.</p>	<p>Fine PK production timeline is updated to the latest mine plan from the 2018 UPD in Table 15 and inconsistencies in timeframes corrected throughout ICRP. Text is updated in Section 4.4.2.3.1 to highlight the transitional period that is present for fine PK disposal to either the Fine PK Facility or Hearne pit in 2022.</p> <p>As noted in Section 4.4.2.3, reference is provided to the Processed Kimberlite and Mine Rock Management Plan regarding management of PK.</p> <p>Multiple additional references to the PK and Mine Rock Management Plan, Updated Project Description, rock pile design plans, etc, are embedded within the text throughout the ICRP. No additional cross-references are considered necessary.</p> <p>Some additional detail regarding the flexibility and sequencing of coarse PK deposition has also been added to Section 4.4.2.3.2.</p>
<p>The project should include a table along with the objectives that outlines the current mine plan, the reclamation activities, the progressive reclamation activities, as well as the anticipated deliverables from the tasks from each of the research reclamation plans.</p>			<p>Figure 40 of the ICRP provides an integrated schedule of activities that depicts the timing for reclamation of mine components throughout the operations and closure phases. Within each section of the Reclamation Research Plan, a schedule for completion of each task is provided. Figure E.1 shows RRP activities and selected project milestones.</p> <p>As identified by De Beers, the information requested by the reviewer is provided in the ICRP. The Board agrees that one figure showing all information with regard to plans and deliverables, and how they are designed to inform progressive reclamation and final closure would be very helpful.</p> <p>Board directs De Beers to create one inclusive table that identifies the relationship between the current mine plan, the reclamation activities, the progressive reclamation activities, as well as the anticipated deliverables from the tasks from each of the research reclamation plans.</p>	<p>An additional summary table is not considered necessary. Table 20 is considered to provide a sufficient summary of the objectives, criteria, reclamation activities and supporting research for each major mine component.</p> <p>An additional column to Table 20 listing the relevant operational monitoring and management plans that address adaptive management or mitigation, with potential impacts on closure, has been added to better illustrate how operational monitoring and adaptive management will feed into and inform the final closure plans, designs and criteria.</p> <p>Text explaining the addition and the relevant link of the plans to closure has been added to Section 5.2.3.</p>
<p>The ICRP lacks any kind of meaningful description as to what will be established, any metrics on what was destroyed, what land classes/ecosystem habitat units will be restored.</p>			<p>On November 25, 2016, De Beers committed to provide:</p> <p>Additional cross-references to the detailed analysis completed as part of the EIS of the pre-disturbance (EIS Section 11.7.2.3.1 Ecosystem Types) and project induced ecological land classifications (EIS Section 11.7.4.1.2 Results); Figure 11.7-5 of the EIS which depicts the pre-disturbance broad ecosystem units in the local study area; and Table 11.7-17 of the EIS which summarizes the local ecosystem disturbances within the project footprint for the closure conditions for the project in Section 3.4.2 of the ICRP. Additional cross-references to the EIS (Section 10.7.2.1) that evaluated the long term effects to wildlife health and wildlife habitat will be added to the ICRP. This has not been done.</p> <p>Board directs De Beers to include EIS information into Section 3.4.2 of the ICRP as committed to on November 25, 2016.</p>	<p>Additional cross-references to the EIS, as well as Figures 11.7-4 and 11.7-5 and Table 11.7-17 from the EIS is added to Section 3.4.2.</p>
<p>Section 2.2.4 - The project should update this section to improve clarity - clearly outlining the types of land use that will be 'safe' and the utility of those land uses.</p>			<p>On November 25, 2016, De Beers provided the following information in response to reviewer comments: De Beers anticipates that the mine site will be used for traditional activities such as travel, hunting, and fishing. This should be added to ICRP V.4.1.</p> <p>Board directs De Beers to include the examples provided into ICRP V.4.1.</p>	<p>The referenced examples of traditional activities of travel, hunting and fishing is added to Section 2.2.4.</p>
<p>Link research plans about final landforms, including PK facilities and Kennady Lake to the body of the ICRP to show that the research is meaningful and will be applied to the final site condition.</p>			<p>On November 25, 2016, De Beers committed to update Table 19 to link applicable research programs to the summary of the final mine site conditions. This was not done.</p> <p>Board directs De Beers to update Table 19 to link applicable research programs to the summary of the final mine site conditions.</p>	<p>Research programs considered to inform the final design and final conditions of each Mine component is referenced in the former Table 20 (formerly 19).</p>
<p>Sections 5.2.5.5.2, 5.2.5.5.4, 5.2.5.5.6, 5.2.5.5.8 - Describe how water and solvents used in the cleaning and/or degreasing of project infrastructure will be managed in order to prevent discharge or release to the receiving environment.</p>			<p>On November 25, 2016, De Beers provided the following information in response to reviewer comments: "Water that has come in contact with hydrocarbons will be collected and deposited in our oil-water separator. The remaining hydrocarbons will be contained, stored in the hazardous waste storage area, and then shipped off site for treatment. The remaining water will be tested against the approved discharge criteria. If it meets those criteria, it will be discharged to the receiving environment at the approved location. If it does not meet the discharge criteria it will either be treated on-site or contained and shipped off-site for treatment/disposal at an approved facility."</p> <p>Board directs De Beers to repeat this level of detail in the ICRP, where most applicable.</p>	<p>Detail regarding the management of cleaning water and/or solvents is added to Section 5.2.5.5.2. Reference to this section for detail on management of cleaning water is added to the other sections (5.2.5.5.4, 5.2.5.5.6, 5.2.5.5.8) that describe cleaning of structures/equipment.</p>

<p>Table 21 - Monitoring of open pits (water quality) and Kennady Lake (aquatic effects) should continue for a minimum of 5 years after reconnecting Kennady Lake to the surrounding waterbodies, and as long as required to establish that closure objectives will be met.</p>			<p>On November 25, 2016, De Beers committed to update Monitoring to state that: "monitoring will continue for a minimum of 5 years and until the closure objectives will be met." De Beers further stated: "Table 21 will be updated accordingly." However, timelines provided for reclamation monitoring of open pits (water quality) and Kennady Lake (aquatic effects) still indicate a limit of "up to 5 years post refilling of Kennady Lake."</p> <p>Board directs De Beers to update Table 21 to reflect commitments to increase monitoring from "up to 5 years" to a "minimum of 5 years and until the closure objectives will be met."</p>	<p>Table 22 (formerly 21) is updated to reflect commitment to monitor a minimum of 5 years post-refilling and until objectives are met.</p>
<p>It is not clearly stated how the timing of air quality monitoring will change during the closure phase of the mine. This information is not in either the ICRP, nor the Air Quality Monitoring and Emissions Management Plan.</p>			<p>On November 25, 2016, De Beers provided the following information in response to reviewer comments: "Air quality will continue to be monitored as per the Air Quality Monitoring and Emissions Management Plan (AQEMMP) during the two years of active closure. For the extended closure period following active closure, the frequency of monitoring will be adjusted in the AQEMMP, in consultation with the Air Quality Division of ENR, GNWT to reflect both the anticipated air quality emissions during that time and operational constraints."</p> <p>Board directs De Beers to include the information regarding post-closure air quality monitoring as provided on November 25, 2016.</p>	<p>As stated in Section 5.2.8.1, a detailed post-closure monitoring plan is developed and included in the Final Closure and Reclamation Plan. Distinct periods of monitoring will include operations/progressive reclamation, closure and post-closure. The scope of monitoring activities, frequency of monitoring events (e.g. annually, every 3 years, etc.) and planned duration for each period is informed by the results of monitoring efforts and inspections completed during mining and into closure. For all monitoring programs, a reduced scope is anticipated to reflect stabilizing of monitoring parameters following completion of applicable reclamation activities. Text specifying the need to consult with stakeholders in developing final monitoring plans is added to Section 5.2.8.1.</p> <p>This is considered sufficient to inform the reader on the anticipated adjustments to monitoring, including for air quality, that will occur for closure and post-closure. Specific detail on the adjustments that will occur are not known at this time. Additional detail is not considered necessary.</p>
<p>Section 5.2.9.1 - There has to date been a greater volume of rock managed as PAG in part due to slow turnaround times of results and conservative classification of rock as PAG in the absence of results.</p> <p>Section 5.2.9.1 of the ICRP remains somewhat unclear. It is said that the current management plan is sufficient to manage the expected 4.8% of PAG but that if greater proportion (7.5%) is encountered then contingency measures for placement could be put in place. Please clarify the issue of PAG volumes, capacities, rock management plans and contingency measures. Include in the discussion of contingency measures some description or link with capacities at various locations and any timing constraints should they exist (i.e. any instances when PAG may need to be re-handled etc.).</p>			<p>On November 25, 2016, De Beers committed to update the approved locations for PAG rock storage with reference to the specific plans that manage the control of PAG rock. The additional contingency volumes and locations will be specified. Any timing issues regarding the use of contingency storage will be noted. This has not been done.</p> <p>Board directs De Beers to update the approved locations for PAG rock storage with reference to the specific plans that manage the control of PAG rock, identify additional contingency volumes and storage locations, and any timing issues regarding the use of contingency storage as committed to on November 25, 2016.</p>	<p>Locations for storage of PAG rock are described in Sections 4.4.1.2, 4.4.2.2 and 5.2.5.3, with references to the management plans added.</p> <p>Contingencies for placement of PAG rock are described in Section 5.2.9.1 and is updated to account for an increase in anticipated PAG rock volumes. It is stated PAG is stored in the submerged and unsubmerged areas of the mine rock piles until the Hearne Pit is available which will provide 15 Mt of additional contingency storage volume. It is not expected that additional contingency storage outside of the rock piles is required before Hearne Pit is available, and no rehandling of PAG rock is necessary. Text is added to Section 5.2.9.1 to clarify this and provide reference to the rock management plan. No additional details regarding capacities and timing is considered necessary.</p>
<p>A map of the pre-development drainage would be useful for setting the base condition.</p>			<p>On June 9, 2017, De Beers committed to providing a map of the baseline watershed with drainage pathways to the ICRP. This has not been done.</p> <p>Board directs De Beers to include a map of the baseline watershed with drainage pathways in ICRP V.4.1.</p>	<p>A map of the baseline watershed and sub-watershed boundaries and drainage directions is provided in Section 3.2.1 of the ICRP.</p>
<p>Reviewers have expressed concerns about the ambiguity of terms such as 'safe', 'satisfactory' and 'significant' which are used to define closure objectives and criteria.</p>			<p>On November 25, 2016, De Beers committed to further define criteria of each mine component where there is uncertainty regarding the definition and/or measurability of current criteria, including the refinement of terms such as 'significant', 'satisfactory' and 'safe'. These commitments remain outstanding and can be addressed in Appendix A – Glossary of Terms and Definitions.</p> <p>Board directs De Beers to provide definitions of 'significant', 'satisfactory' and 'safe' in Appendix A of the ICRP.</p>	<p>Definitions for satisfactory and significant is added to Appendix A.</p>
<p>N/A</p>			<p>Figure 40 – Project Schedule has not been updated since ICRP V.3 based on several project changes. This has implications throughout the ICRP text.</p> <p>Board directs De Beers to update Figure 40 and any references throughout the ICRP text based on several project changes since 2016.</p>	<p>Figure 40 as well as all references, schedules, timeframes throughout the ICRP is updated for consistency with the most recent 2018 UPD.</p>
<p>N/A</p>			<p>Appendix D - The Board's Closure Guidelines requires updated photographs depicting what the site looks like during operations. The most recent photos are from 2015.</p> <p>Board directs De Beers to provide updated photos in Appendix D of the ICRP. If corresponding updates are required in Table 19 of the ICRP (existing conditions), that should also be updated accordingly.</p>	<p>An updated satellite image and site photos have been added to Appendix D.</p>

N/A			<p>Section 7.5 - The Board's Closure Guidelines requires a description of the anticipated timing and sequence of events preparing for and occurring during temporary closure. De Beers has stated that specific schedules to execute the temporary closure activities would be developed in response to the cause and duration of temporary closure. Some thought should be given and stated, even as a hypothetical, in ICRP V.4.</p> <p>Board directs De Beers to provide more information on what a temporary closure might look like, as required by the Board's Closure Guidelines.</p>	<p>Additional detail on temporary closure is not considered necessary at this time. Current information details what is required for temporary closure and a schedule is committed to be developed at time of decision to enter into temporary closure. Adding hypothetical schedules do not provide value for execution.</p> <p>Text explaining the submission of a C&M plan to the Board for review prior to initiation of temporary closure has been added to Section 7.5.</p>
N/A			<p>Section 7.3 – 7.5 - The Board's Closure Guidelines requires De Beers to:</p> <p>Provide a rationale for defining what is meant by short-term or long-term closure and why the closure management and/or activity will vary based on length of shutdown; Describe any security and access issues to ensure site safety is maintained during temporary closure; and, Provide information on the number of on-site workers and others that would support a monitoring program.</p> <p>Board directs De Beers to provide more information on what a temporary closure might look like, as required by the Board's Closure Guidelines.</p>	See response to Line 105.
N/A			<p>Section 3.4.2 - ICRP V.4 states that the Mine footprint will be provided at the end of the construction phase, which is expected in 2016.</p> <p>Board directs De Beers to update information on the total mine footprint to date.</p>	The current total mine footprint is added to Section 3.4.2 based on the 2018 UPD.
N/A			<p>ICRP V.4 refers to a detailed summary of the socio-economic components, which includes the KLOIs long-term social, cultural and economic effects, family and community cohesion, and social disparity (Section 12 of the EIS).</p> <p>Board directs De Beers to summarize this information in the ICRP as required by the Board's Closure Guidelines.</p>	<p>With regards to final site conditions, water and land use and wildlife use are considered indirectly related to social elements and are addressed within the current proposed objectives.</p> <p>A summary of the socio-economic elements have been to the main body of the ICRP in Section 4.4.2.5.</p>
N/A			<p>Table 19 of ICRP V.4, updated by De Beers in response to reviewer comments on August 21, 2018, includes a change that does not appear to be in response to reviewer comments. Under 'Final Conditions' for Open Pits, De Beers have added:</p> <p>"Backfilling and freshwater caps applied to the open pits may be adjusted from that described above based on mine operations."</p> <p>Board directs De Beers to provide some background to explain what exactly this means, why it will be included, and whether or not it could have implications closure objectives, research plans, activities or criteria.</p>	Statement was added to allow for flexibility during operations. It is not anticipated to have implications on the research plan, operational management plans, closure plans, closure activities or criteria. All activities or adjustments will achieve the closure objectives. Statement added to Table 20.

Table 7: Annual Closure and Reclamation Plan Progress Report

Objective	Board Direction	ICRP V.4	Comments	Response
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SW1 – Air quality levels safe for people, vegetation, aquatic life and wildlife.	On September 14, 2017, the Board directed De Beers to include an options analysis for cover designs and identification of priority areas selected for revegetation.	<p>On May 5, 2017, De Beers provided a summary of options considered during initial mine planning to mitigate against dust generation: balancing the footprint of PKC and mine rock pile size to height, placement of a cover over the PKC piles, and promotion of natural revegetation at priority areas at disturbed areas.</p> <p>De Beers also indicated that PK Facility cover designs were not yet completed, but it will be developed to a schematic level. Final designs will be completed prior to the PK facility reaching capacity in years 2021 and 2023, respectively.</p>	Board reminds De Beers that any changes to the ICRP as a result of this new information (including Final engineering designs for each mine component yet to be completed) will be required in the Annual Closure Progress Report.	Noted.
SW2 – Drainage pathways for surface runoff are physically stable	<p>On September 14, 2017, the Board directed De Beers to include the following items in ICRP V.4:</p> <ul style="list-style-type: none"> Options analysis of final plans for site wide drainage pathways; Conceptual plans for drainage from the waste rock piles, PK piles, and general site wide drainage requirements; If conceptual plans are not yet completed, details from the Operational Management Plan should be summarized or referenced with regards to potential future water management options at closure and how they might apply to final site conditions. 	On May 14, 2018, De Beers indicated that options analysis of final plans for site wide drainage pathways and conceptual plans for drainage from waste piles, PK piles and general site wide drainage will be done as part of the RRP in Section 3.	Board reminds De Beers that any changes to the ICRP as a result of this new information will be required in the Annual Closure Progress Report.	Noted.
SW5 – Safe passage and use for Caribou and other wildlife.	<p>On September 14, 2017, the Board directed De Beers to include the following items in V.4 of the ICRP:</p> <ul style="list-style-type: none"> A summary of alternatives assessed during EIA; De Beers description of cover options provided May 5, 2017; Benefits of the chosen activity to meet objective SW5. 	<p>Removal of all buildings, equipment, and surface hazards. A final grading/contouring plan will be developed for each Mine Rock Pile and PK facility, as well as, a plan that addresses the remainder of the Mine outside these facilities. Re-contouring of surface materials to reduce ground hazards and reflect surrounding topography where possible. Where applicable, final site grading/contouring will be informed by operational wildlife monitoring. Engineered earthen structures remaining at the site (i.e. Mine Rock Piles, Fine PK Facility and Coarse PK Pile) will be physically stable. See MR and PK closure objectives below for details specific to stability of mine waste areas... ...Monitoring of landform reclamation efforts will include assessment of habitat improvement.</p>	Board reminds De Beers that once RRP's are complete and final design features are known, options analysis and details of selected activity will be required in the Annual Closure Progress Report.	Noted.
N/A	N/A	Section 3.1 – This section refers to the establishment of meteorological stations at Gahcho Kue in 2015. No information from these stations will be included in the Atmospheric Environment Section of the ICRP.	<p>The Closure Guidelines require regional and local climate setting, temperature and precipitation statistics and trends based on regional and project-specific climate stations. Stations were established in 2015.</p> <p>Board requires De Beers to provide general descriptions of regional and site air quality conditions and how the existing mining development is affecting air quality (as measured as opposed to predicted or estimated) in its next Annual Closure Progress Report.</p>	Noted.

N/A	N/A	<p>Section 5.2.8 - The Board's Closure Guidelines requires a description of the residual environmental impacts of the entire project once reclamation and closure activities will be completed, and a preliminary assessment of residual environmental impacts that are predicted to occur at the end of reclamation and closure activities.</p> <p>It also requires an explanation of any maintenance activities that will occur during post-closure monitoring, and an outline of the monitoring reports and the frequency that these reports will be provided.</p>	<p>ICRP V.4 states that a detailed plan of tasks required to complete a post-closure site assessment for the Mine site has not been developed at this time. A detailed description of the proposed post-closure site assessment methods will be developed as the final closure designs for various mine areas are submitted for review and approval.</p> <p>A summary or list of monitoring reports is not provided, just references to requirements of authorizations.</p> <p>Board reminds De Beers that information about monitoring and reporting residual project impacts be provided as soon as it is available in the Annual Closure Progress Report.</p>	Noted.
N/A	N/A	<p>Section 5.2.6 - The Board's Closure Guidelines requires De Beers to provide results of any relevant risk assessments and contingencies to deal with the residual effects.</p>	<p>ICRP V.4 states that post-closure risk assessment (human health and wildlife) will be completed at a later date.</p> <p>Board reminds De Beers that this information should be provided as soon as it is available in the Annual Closure Progress Report.</p>	Noted.
N/A	N/A	<p>Section 6.3 - The Board's Closure Guidelines requires a description of any monitoring activities that will occur solely for the purposes of addressing progressive reclamation to ensure that the goals and objectives of the closure and reclamation plan will be met.</p>	<p>ICRP V.4 states that specific details of monitoring during progressive reclamation will be determined prior to commencement of progressive reclamation. This information should be provided as soon as it is available in the Annual Closure Progress Report.</p>	Noted.
N/A	N/A	<p>Section 5.9.2 - The Board's Closure Guidelines requires a description of how unforeseen events or conditions would be handled and how any closure monitoring might be affected.</p>	<p>ICRP V.4 states that closure contingency plans will be developed as further reclamation and monitoring information becomes available.</p> <p>Board reminds De Beers that this information should be provided as soon as it is available in the Annual Closure Progress Report.</p>	Noted.