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November 6, 2023

File: W2020L2-0004

Glen Swanson  
Arctic Canadian Diamond Company Ltd.  
900-606 4 Street SW  
Calgary, AB T2P 1T1

Sent by email

Dear Glen Swanson,

**Re: Ekati – Point Lake Waste Rock Storage Area Design Plan Version 1.1 and Seepage Prediction Report Version 1.1 – Approved with Revisions Required - Lac de Gras, NT**

The Wek'èezhìi Land and Water Board met on November 1, 2023 and considered the Point Lake Waste Rock Storage Area Design Plan Version 1.1 and Seepage Prediction Report Version 1.1,<sup>1</sup> submitted by Arctic Canadian Diamond Mine Ltd.'s (Arctic) on July 5, 2023, as required by Water Licence (Licence) W2020L2-0004.

The Board has approved the Point Lake Waste Rock Storage Area Design Plan Version 1.1 and the Seepage Prediction Report Version 1.1, and requires that Arctic revise the Design Plan and Seepage Prediction Report as detailed in the Board's Reasons for Decision (attached).

Arctic is to work with Board staff to determine the timing for addressing the items detailed in the Board's Reasons for Decision. These submissions should be prepared in accordance with the Land and Water Boards' *Document Submission Standards*.<sup>2</sup>

Please direct questions or concerns regarding this letter to Ryan Fequet in writing.

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<sup>1</sup> See WLWB Online Registry for See WLWB Online Registry for [Ekati – Point Lake WRSA Design and Seepage Prediction Report V1.1 – Part 1 of 3](#), [Part 2 of 3](#), and [Part 3 of 3](#).

<sup>2</sup> See WWB Policies and Guidelines webpage for MVLWB [Document Submission Standards](#).

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Mason Mantla', written in a cursive style.

Mason Mantla  
Chair, Wek'èezhì Land and Water Board

BCC'd to: Ekati Distribution List  
Jamie Steele – Inspector, GNWT-ECC

Attached: Reasons for Decision



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## Reasons for Decision

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|-------------------------------|--|
| <b>Reference/File Number:</b> | W2020L2-0004 (Type "A" Water Licence)  |
| <b>Licensee:</b>              | Arctic Canadian Diamond Company Ltd. (Arctic)                                  |
| <b>Subject:</b>               | Point Lake WRSA Design V 1.1<br>Point Lake WRSA Seepage Prediction Report V1.1 |

## Decision from the Wek'èezhìi Land and Water Board Meeting of November 1, 2023

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### 1.0 Decision

On November 1, 2023, the Wek'èezhìi Land and Water Board (WLWB or Board) met and considered Version 1.1 of the Point Lake Waste Rock Storage Area (WRSA) Design Plan and Version 1.1 of the Point Lake Seepage Prediction Report,<sup>3</sup> submitted by Arctic Canadian Diamond Company Ltd. (Arctic) to the Board on July 5, 2023. After reviewing the submissions and the evidence gathered during the regulatory proceeding, the Board has made the following decisions:

1. Approve Version 1.1 of the Design Plan and Version 1.1 of the Seepage Prediction Report;
2. Require Arctic to submit Version 1.2 of the Design Plan and Version 1.2 of the Seepage Prediction Report to include Revisions 1 to 4, and work with Board staff to determine an appropriate but timely submission;
3. Require ground temperature monitoring to occur during construction of the Point Lake WRSA;
4. Require Arctic to submit an updated closure cost estimate and a cover alternatives analysis at a time that will be determined by the Board in its decision on Version 3.1 of the interim CRP. The cover letter for the updated closure cost estimate should include a conformity table that describes how each of the following comments have been addressed, or otherwise provide an explanation

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<sup>3</sup> See WLWB Online Registry for [Ekati – Point Lake WRSA Design and Seepage Prediction Report V1.1 – Part 1 of 3](#), [Part 2 of 3](#), and [Part 3 of 3](#).

for why the comment was not further considered: Tłıchq Government comment 5 and WLWB staff comments 3 and 5;

5. Require Arctic to use the CMIP6 model in the cover alternatives analysis for the Point Lake WRSA. Submission of the cover alternatives analysis is to include justification for the selected climate scenario;
6. Require Arctic to include a conformity table in its next submission of the WROMP that describes how each of the following comments have been addressed, or otherwise provide a detailed explanation for why the comment was not further considered: GNWT-ECC comments 4 and 8, WLWB staff comment 21, and IEMA comment 8;
7. Require Arctic to include a concordance table in the cover letter of the Final Cover Design that describes how each of the comments included in Table 1 have been addressed, or otherwise provide a detailed explanation for why the comment was not further considered; and
8. Require Arctic to include a concordance table within the next version of the Closure and Reclamation Plan that describes how the comments in Table 2 have been addressed.

## **2.0 Background**

The Point Lake Pit is located northeast of the Misery site. Waste rock and till overburden removed by mining of the open pit is planned to be placed in the WRSA and overburden stockpile located generally to the north and west of the open pit.

At the end of operations, the proposed WRSA would have a length of 1,300 m, a width of 730 m, a maximum height of 48 m, and an overall slope between 3.6H:1V and 4.2H:1V. At closure, the rock in the WRSA is planned to be covered with a layer of till and a layer of granite/diabase waste rock. The Design Plan included a preliminary cover design that evaluated a 3 m thick till with a 0.5 m waste rock layer placed above the till for a total cover thickness of 3.5 m. The WRSA includes a trench constructed along the west and north perimeter to collect seepage to a sump that will be constructed to the north of the WRSA. No trench is being proposed for construction on the east and south sides of the WRSA because any seepage from these locations will drain to the open pit. Seepage that accumulates in the sump will be pumped to the King Pond Settling Facility (KPSF) for its management. The seepage that drains to the open pit will be managed as part of the open pit water management during mine operations. The management of seepage post-closure is conceptually described in the Design Plan and Seepage Prediction Report to involve the passive release of seepage water from the WRSA to Point Lake pit or onto the land surrounding the WRSA which drains towards Christine Lake; however, the specifics are not defined at this time.

At the end of operations, the proposed overburden stockpile would have a length of 900 m, a width of 460 m, a maximum height of 40 m, with overall slopes of 3.8H:1V. At closure, overburden is planned to be used for covering the WRSA. Approximately half of the overburden stockpile is proposed to be used for the WRSA cover and the height of the overburden stockpile after closure will be 17.5 m.

The Board completed a preliminary screening on the Point Lake Project (of which the Point Lake WRSA is a part of) to determine if the project should be referred to an environmental assessment in accordance with the *Mackenzie Valley Resource Management Act*. In the Board's Preliminary Screening Determination for the Point Lake Project, the Board stated:<sup>4</sup>

No mitigative or remedial options are currently presented by Arctic. The Board understands that one of the contingencies for poorer than anticipated seepage water includes collection; however, one of the four core principles of the MVLWB *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories* is 'no long-term active care requirements'.

The Board understands that the geochemistry of the proposed WRSA for Point Lake poses a potentially greater risk of poor seepage water quality post-closure and that there is uncertainty regarding the length of time required for post-closure seepage collection. The Board however recognizes that closure options for the Point Lake WRSA can be further addressed through existing Licence requirements (e.g., Closure and Reclamation Plan) and that the Board can consider including modeling and/or prediction requirements prior to construction of the WRSA in the Licence. Thus, the Board is of the opinion that mitigations can be addressed and implemented through the licensing phase. The Board also notes that the approved interim [Closure and Reclamation Plan] for the Ekati site includes an approved closure goal of no long-term care at closure. As part of this preliminary screening determination, the Board has assumed no need for perpetual water collection/treatment post-closure, as per the approved interim [Closure and Reclamation Plan]. If during the course of the licensing proceeding it comes to light that there is a need for long-term active care, the Board may need to further address mitigation needs before completion of the licence amendment.

The Board highlights that the Preliminary Screening Determination was based on the understanding that the Point Lake WRSA would not require perpetual water collection/treatment post-closure. As a result of the outstanding uncertainty through the Point Lake Amendment proceeding, the Board included two requirements in Licence W2020L2-0004 for the submission and approval of a WRSA Design Plan and Seepage Predictions Report (i.e., Part F, Condition 3, and Part H, Condition 26, respectively).<sup>5</sup>

The Design Plan includes the engineering design for the WRSA and associated perimeter trench and sump, the thermal analysis to predict temperatures within the waste rock stockpile, as well as the engineering design for the overburden stockpile. The Seepage Prediction Report (Seepage Report) presents the predictions of seepage quality that daylight from the WRSA. The QA/QC Plan describes the monitoring checks that will be completed during construction of the WRSA and associated perimeter trench and sump, as well as the overburden stockpile to ensure that it is constructed according to the design.

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<sup>4</sup> See WLWB Online Review for [Ekati - Point Lake Project - Preliminary Screening Determination and Reasons for Decision - Aug 24 21](#).

<sup>5</sup> See WLWB Online Registry for [Ekati - Water Licence - Jun 27 22.pdf](#)

The Board rejected Version 1.0 of the Design Plan and Seepage Report on August 24, 2021 because it determined that amongst other reasons, the submissions failed to demonstrate that perpetual water collection/treatment post-closure wouldn't be required.<sup>6</sup> Arctic submitted Version 1.1 of the Design Plan, Version 1.1 of the Seepage Report on July 5, 2023; a Quality Assurance and Quality Control Plan (QA/QC Plan, as required by Schedule 5, Conditions 2.xix) was submitted with Version 1.1 of the Design Plan.<sup>7</sup>

The Design Plan and Seepage Prediction Report were distributed for public review on July 10, 2023, inviting reviewers to provide comments and recommendations using the Online Review System by August 21 2023. On August 22, 2023, Board staff requested additional QA/QC Plan information from Arctic that was related to Decision 5 from the Board's Reasons for Decision for Version 1.0 of the Point Lake Design Plan and requirements of Schedule 5, Conditions 2(b)(iv) and 2(b)(xix) of the Licence. On September 6, 2023, the public review timelines were adjusted to address the evacuation order related to the wildfire situation in the Northwest Territories and to allow reviewers time to consider the new QA/QC information. The updated deadline for public review comments was September 20, 2023 with Arctic's responses due September 27, 2023.

Comments and recommendations were received by the September 20, 2023 deadline from the Tłı̨chǫ Government, the Independent Environmental Monitoring Agency (IEMA), the Government of the Northwest Territories – Environment and Climate Change (GNWT-ECC); Board staff also submitted questions. Environment and Climate Change Canada (ECCC) and Fisheries and Oceans Canada (DFO) indicated it had no recommendations at the time. Arctic provided responses to reviewer comments by the deadline of September 27, 2023. The review summary is available on the Online Review System.<sup>8</sup>

### **3.0 Reasons for Decision**

The Board has reviewed Arctic's submission, all reviewer comments, and Arctic's responses submitted during the public review period. Arctic's submissions addressed the Board's direction by including Arctic's rationale for why it believes perpetual water collection/treatment post-closure will not be needed. No parties indicated they believed that perpetual water collection would be needed based on the submission, no parties recommended that the Board not approve the Design Plan and Seepage Report, and the Tłı̨chǫ Government (comment 2) recommended approval. For these reasons the Board has decided to approve Version 1.1 of the Design Plan and Version 1.1 of the Seepage Report. While no parties indicated they believed that perpetual water collection would be needed, reviewers did comment on uncertainties and concerns related to the quality of seepage; thus, uncertainty regarding the acceptability of seepage at closure still remains. This issue is addressed further in sections 3.2 and 3.3 of these Reasons for Decision.

- ***Decision #1: The Board has approved Version 1.1 of the Design Plan and Version 1.1 of the Seepage Report.***

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<sup>6</sup> See WLWB Online Registry for [Ekati - Board's Reasons for Decision for Version 1.0 of the Point Lake WRSA Design Plan](#).

<sup>7</sup> See WLWB Online Registry for [Ekati – Point Lake WRSA Design and Seepage Prediction Report V1.1 – Part 1 of 3, Part 2 of 3, and Part 3 of 3](#).

<sup>8</sup> See WLWB Online Review System for [Ekati – Point Lake WRSA Design Plan and Seepage Prediction Report - Review Summary](#).

### 3.1 Design Plan and Seepage Report

Comments were received by several reviewers and relevant information is summarized within the following topics:

- Topic 1 – Review comments or recommendations that the Board considers to be straightforward or administrative in nature and can be included in a revised Design Plan and/or Seepage Prediction Report (i.e., Versions 1.2).
- Topic 2 – Review comments the Board is of the opinion have been adequately responded to by Arctic and revisions to the Design Plan and/or Seepage Report are not considered necessary.

The Board is of the view that revisions to the Design Plan and Seepage Report would be helpful to ensure fulsome submissions are available to all parties and members of the public; however, are not requiring these revisions prior to Construction.

- ***Decision #2: Require Version 1.2 of the Design Plan and Version 1.2 of the Seepage Report to include Revisions 1 to 4, and that Arctic work with Board staff to determine an appropriate but timely date for submission.***

#### Topic 1

WLWB staff inquired (comments 1 and 2) if the design intent and objectives for the WRSA were consistent with the proposed design. For example, WRSA cover design intent was to freeze the waste rock pile to encapsulate the potentially acid generating rock below the cover; however, the thermal analysis for the preliminary cover configuration shows that a portion of the waste rock will not remain frozen post-closure. In response to WLWB staff (comments 1 and 2), Arctic provided revised design objectives for the Design Plan that the Board is of the opinion are consistent with the results of the analysis. The Board requires that the Design Plan be revised to include the design objectives summarized in response to WLWB staff comments 1 and 2. Despite the inconsistency between the design objectives as described in the Design Plan compared to the result of the analysis, the Board is of the opinion that this inconsistency did not impact the recommendations provided by reviewers and that reviewers understood the outcome from the thermal predictions that the waste rock will not remain frozen post-closure (e.g., GNWT-ECC comment 9, TG comments 5 and 12, and IEMA comments 2, 3, 5, 14, and 15).

- ***Revision #1: Arctic to revise the Design Plan to clarify the Design Objectives as per the response to WLWB staff comments 1 and 2.***

Several reviewers provided comments that revealed that the Design Plan or Seepage Prediction Report was missing relevant information. Arctic adequately responded to these comments; however, they did not commit to revising the submissions with the provided information. The Board is of the opinion that these items are mainly administrative to address and requires Arctic to update the Design Plan and Seepage Prediction report to address the following:

- i. Include the information provided in the response to review comments, specifically Figure D19 that was originally omitted (WLWB staff comment 6 and IEMA comment 11);
  - ii. Confirm, and provide supporting information, that Arctic has engaged the Tłıchǫ Government on the waste rock storage area configuration and that the outcomes of the engagement are acceptable to the Tłıchǫ Government (TG comment 3); and
  - iii. Include the omitted Professional Engineer authorizations (WLWB staff comments 12 and 17).
- **Revision #2: Arctic to update the Design Plan and Seepage Report to address reviewer comments associated with Topic 1, bullets i. to iii., and to include in the updated Design Plan and Seepage Report a concordance table to identify where the reviewer comments were addressed.**

GNWT-ECC (comment 9), WLWB staff (comments 7, 8, 16, and 18), and IEMA (comment 10) provided comments or recommendations associated with the monitoring during construction of the WRSA, overburden pile, and associated water management structures, as well as the specifications for the liner used in the water management structures. These items are related to the QA/QC Plan and design specifications that are required to be included within the Design Plan to satisfy Schedule 5, Conditions 2.xix and 2.iv of the Licence, respectively. On review of Arctic’s responses to reviewer comments, the Board is of the opinion that responses to WLWB staff comments 7 and 18 also address the other reviewer comments noted above. The Board requires Arctic to revise the Design Plan to include the QA/QC specifications provided in response to WLWB staff comment 7 and Arctic’s response to WLWB staff comment 18.

- **Revision #3: Arctic to revise the Design Plan to include the QA/QC specifications provided in response to WLWB staff comment 7 and Arctic’s response to WLWB staff comment 18.**

Tłıchǫ Government (comment 17) recommended “installing long-term instrumentation to monitor ground temperatures in the pile”. Arctic responded that ground temperature monitoring should be determined in the Final Cover Design. WLWB staff had a related comment (comment 10) requesting additional information with regards to monitoring of the waste rock temperatures during construction of the rock pile. IEMA (comment 4) recommended thermal monitoring of the WRSA during operations and post-closure. Arctic responded that instrumentation may be installed to monitor temperature during construction and has been done at other rock piles at Ekati. Based on Arctic’s response to Tłıchǫ Government (comment 17), WLWB staff (comment 10), and IEMA (comment 4), it is unclear whether ground temperature monitoring instrumentation will be installed during construction of the pile. Arctic has stated that instrumentation to measure ground temperature can be damaged during operations and that “thermistors may be installed during the WRSA construction at strategic locations that minimize risk of instrumentation damage”. The Board understands that ground temperature monitoring would be useful during construction to inform the Final Cover Design and contribute to long-term ground temperature monitoring, and is also a common practice at other northern and remote mine sites. The Board requires ground temperature monitoring to occur during construction of the WRSA to meet the Tłıchǫ Government’s recommendation and to aid in informing the Final Cover Design, and that the Design Plan is revised accordingly.



- ***Decision #3: The Board requires ground temperature monitoring to occur during construction of the WRSA.***
- ***Revision #4: Arctic to revise the Design Plan to include ground temperature monitoring of the waste rock during the construction of the rock pile.***

## Topic 2

Numerous comments were provided by reviewers seeking clarification on various components of the Design Plan or Seepage Prediction Report, as follows:

- Requests for additional information or clarification regarding the selection of model input parameters or the conceptual model adopted in the analysis (GNWT-ECC comment 13; TG comments 11 and 13; WLWB staff comments 13 and 14; and IEMA comments 12 and 13);
- Requests for clarification on seepage monitoring and management (TG comments 7, 8, and 15; and IEMA comment 7) and ground temperature monitoring (TG comment 16);
- Request for clarification on design drawings (WLWB staff comment 11); and
- Request for clarification on QA/QC processes (WLWB staff comments 20 and 22).

The Board has reviewed Arctic's responses to these comments and recommendations and is of the opinion that the responses adequately provide the necessary clarity or additional information. The Board is of the opinion that revisions to the Design Plan or Seepage Report with Arctic's responses are not necessary because these items are either already included in the submissions or would not provide substantially new information that would aid in understanding the analysis or results.

### **3.2 Perpetual Water Collection/Treatment Post-Closure**

The Seepage Report provided predictions of seepage quality during post-closure at the toe of the WRSA and in Christine Lake. Christine Lake is located approximately 250 m Northwest from the proposed Point Lake WRSA and a portion of this seepage from the WRSA would passively drain to this location if the seepage water is not actively managed. The predicted seepage quality was compared to water quality benchmarks, which were the selected benchmarks used for the Ekati mine site Aquatic Effects Monitoring Program (AEMP). Arctic identified that the benchmark values may not be specific to the receiving waters associated with the Point Lake development and not be directly applicable to the Point Lake project, but the comparison of the predicted values to the benchmark values provides context for understanding closure planning for the Point Lake WRSA.

Based on the predictions of seepage quality and Arctic's response to WLWB staff comment 15 on the topic of water quality modelling, the Board understands that the seepage from the WRSA will exceed water quality benchmark values, for at least one water quality parameter, regardless of the model configurations provided. The predicted timeframe when exceedances of water quality occur are related to the modelled period. Arctic presents models that predict water quality with different time frames, the Operations Model that predicts seepage during operations (2023-2027), closure (2027-2030), and early post-closure

(2032-2040). Appendix F of the Seepage Report indicates at minimum one water quality parameter exceeding a benchmark, and two post-closure models with predictions spanning to 2100 and 2130 respectively. The post closure models include the time frame when thawing of the waste rock occurs (predicted to start around 2078) and both predict at minimum one water quality parameter exceedance for all scenarios considered using the two models. Predictions of seepage quality were not provided after this time and therefore it is unknown if exceedances for water quality will occur beyond this timeframe, and if so, for how long. WLWB staff (comment 3) asked for the anticipated time span during which rock pile seepage would be collected. Arctic responded, indicating a 10-year timeframe following cover placement (therefore at year 2040) is rational for a monitoring timeframe based on predictive modelling and would be updated as part of the Final Cover Design. The Board is of the opinion given the predicted duration for exceedances of water quality benchmarks (i.e., until 2100, 2130, or longer) are at a time later than the planned duration for collection and management of water from the WRSA (i.e., 10-years post closure or around 2040), that seepage water collection and management may be required at a timeframe later than 10 years and it is unknown for how long.

The Board notes that Part H, Condition 14 of the Licence requires all mine water from the Point Lake Development to be collected and managed by the King Pond Settling Facility (KPSF) and/or Lynx pit. Therefore, the Licence does not currently permit the passive release of Point Lake WRSA seepage water toward or within Christine Lake during operations or post-closure. The approach for seepage management used to predict seepage quality in the Seepage Report, specifically that the WRSA seepage can passively be released beyond the WRSA water management structures (e.g., trench and sump) post-closure, is not consistent with the Licence. There is uncertainty regarding whether discharge into Christine Lake will be appropriate and therefore authorized through a future licence amendment proceeding. Further, no closure criteria for water quality criteria have been established for release of seepage from the Point Lake WRSA.

The Tłı̨chǫ Government (comment 5) and WLWB staff (comments 3 and 5) identified the connectivity regarding seepage monitoring and management post-closure and whether the security estimate or this aspect of the project correctly reflects the outcomes presented in the Design Plan and Seepage Report. The Tłı̨chǫ Government recommended “the Board set a performance holdback for the Point Lake WRSA to address uncertainty in water quality”. Arctic responded that it is premature to set a performance holdback. Board staff inquired (comment 3) if the timeframe for post-closure monitoring assumed in the reclamation security reflected the timeframe for when management of seepage water may be required, as predicted in the Seepage Prediction Report. In response to WLWB staff, Arctic stated “The currently planned post-closure monitoring timeframe for the Point Lake WRSA is 10 years following cover placement”. The Board believes that a 10-year timeframe after cover placement for post-closure monitoring and seepage management, as applied in the security estimate, is not supported by the predictions presented in the Seepage Predictions Report, which shows thawing of the rock in the WRSA and seepage quality that exceeds benchmark values at a time after a 10-year period following cover placement.

By allowing the Construction of the Point Lake WRSA to proceed, the Board may have less options in the future to mitigate this uncertainty. IEMA (comment 3) recommended a cover alternatives analysis be undertaken. Arctic responded that its proposed preliminary cover design provides confidence in achieving the approved closure objectives. The Board notes that seepage water quality from WRSAs must be safe for people, terrestrial, and aquatic ecosystems, and while closure water quality criteria have not yet been determined, the Board does not believe Arctic has provided adequate evidence to demonstrate that this closure objective will be achieved. The Board believes it is necessary to mitigate the uncertainty related to post-closure water quality in a timely manner and therefore requires Arctic provide an updated closure cost estimate and an options analysis (e.g., improving freezing, reducing infiltration, etc.) that is supported by water quality predictions. The Board recognizes that Version 3.1 of the CRP is undergoing consideration and will provide further direction on the timing of these submissions as part of its decision on that submission.

With Version 1.0 of the Design Plan, Arctic identified additional liability costs associated with reclamation of the WRSA that were not considered at the time the Point Lake Project security amount was determined. In its consideration of Version 1.0, the Board did not set security and required an estimate be submitted with Version 1.1.<sup>9</sup> Since that time, in response to a request from the GNWT, the WLWB reviewed security for all of the Ekati site. Through this review, Schedule 2 was updated to include an addition \$6.6M associated with the Point Lake WRSA.<sup>10</sup> With submission of Version 1.1 of the Design Plan, Arctic indicated that the security amount associated with the Point Lake project had not changed from that proposed in Version 1.0 of the Design Plan. No parties proposed a different amount of security related to the Point Lake project at this time.

- ***Decision #4: Arctic is to submit an updated closure cost estimate and a cover alternatives analysis at a time that will be determined by the Board in its decision on Version 3.1 of the interim CRP. The cover letter for the updated closure cost estimate should include a conformity table that describes how each of the following comments have been addressed, or otherwise provide an explanation for why the comment was not further considered: Tłıchq Government comment 5 and WLWB staff comments 3 and 5.***

### 3.3 Climate Change

The Tłıchq Government (comment 10), GNWT-ECC (comment 7), WLWB staff (comment 5), and IEMA (comments 5 and 14) provided comments or recommendations with regards to climate change and the influence of the selected future climate scenario on the thermal and seepage predictions. With regards to the future climate scenario that could be used in the cover design, Tłıchq Government (comment 10) recommended the Board ensure that the future climate scenario is “satisfactory” but did not provide its opinion on the scenario to select; IEMA (comment 5) recommended that the most up-to-date projections for climate change should be used in the cover design. Arctic stated the climate scenarios considered in

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<sup>9</sup> See WLWB Online Registry for [Ekati - Point Lake WRSA Design and Seepage Prediction Report - Reasons for Decision - Nov 30 22.pdf](#)

<sup>10</sup> See WLWB Online Registry for [Ekati - GNWT Request to Adjust Security - Reasons for Decision - Mar 21 23.pdf](#); [Ekati - Changes to Authorizations to Reflect Security Decision - Reasons for Decision - May 18 23.pdf](#)

the preliminary cover design are appropriate and that the final cover design will include “an evaluation and selection of current and credible climate change projections”.

Predictions of future climate from the international community evolve and are updated over time. For example, the most recent version of the climate models is the sixth phase of the Coupled Model Intercomparison Project, called CMIP6. The Intergovernmental Panel on Climate Change (IPCC) reports on the state of knowledge of climate change and in 2023 reported on the state of knowledge of climate change, that considered CMIP6 climate models.<sup>11</sup> The CMIP6 climate models are newer than the fifth phase of the Coupled Model Intercomparison Project, called CMIP5.

The CMIP5 and CMIP6 climate models provide more than one scenario of the future climate that generally reflect efforts by society to mitigate conditions that contribute to climate warming (e.g., emissions). The CMIP5 climate models refer to these scenarios as Representative Concentration Pathways (RCPs) and include a low emission scenario (RCP2.6), two intermediate scenarios (RCP4.5 and RCP6.0), and a high emission scenario (RCP8.5). In general, the higher the emission scenario (e.g., RCP8.5 is higher than RCP2.6), the warmer the future climate. The CMIP6 climate models refer to these scenarios as Shared Socio-economic Pathways (SSPs). There are five primary (called tier 1) CMIP6 scenarios, SSP1 through to SSP5, where SSP5, generally, has a warmer future climate compared to SSP4, with SSP1 representing a future climate with the least amount of warming. For each of the tier 1 CMIP6 scenarios, there are several tier 2 scenarios that provide estimate of the future climate for a range of additional factors.

Due to the release of new climate models during the development of the Design Plan and Seepage Prediction Report, Arctic’s climate change projections utilized the climate models from CIMP5 using the RCP4.5 scenario, as well as a sensitivity assessment using the climate models from CIMP6, specifically scenario SSP4-6.0. The Design Plan states the CMIP6 SSP4-6.0 climate scenario is a more conservative estimate of the climate warming compared to the CMIP5 RCP4.5 climate scenario. Arctic informed that the CMIP5 RCP4.5 climate scenario had been previously used at the Ekati mine; however, the reasons for selecting the RCP4.5 scenario compared to a higher or lower emissions scenario (e.g., RCP4.5 or RCP6.0) were not described. The Design Plan does not inform the reasons for selecting the CMIP6 SSP4-6.0 climate scenario compared to a higher or lower SSP scenario (e.g., SSP3 or SSP5). IEMA (comment 5) noted, and Arctic agreed, that the WRSA Final Cover Design should be based on the climate change predictions available at the time.

The Board notes that it is not known why CMIP6 SSP4-6.0 climate scenario was initially selected by Arctic, and it is unknown if this climate scenario is appropriate for use at the Ekati mine. However, given the existing uncertainty regarding the potential need for post-closure water collection/treatment, the Board has decided to exercise precaution and require the use of a more current model and a more conservative scenario. For clarity, the Board is not requiring a specific climate scenario that should be adopted for use

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<sup>11</sup> IPCC, 2023: Summary for Policymakers. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 1-34, doi: 10.59327/IPCC/AR6-9789291691647.001

at Ekati but is requiring Arctic to use the CMIP6 model in the cover alternatives analysis because it is more conservative and a newer climate model compared to the CMIP5. At this time, the Board is not requiring that a specific climate scenario (e.g., CMIP6 SSP4-6.0) be used because it does not have the evidence to be able to determine which one would be the best in this circumstance. Thus, the Board encourages Arctic to use the most conservative option and to engage with Parties prior to selecting the most appropriate one because these steps may allow Arctic to focus on evaluating one scenario and could reduce the amount of analysis required. Regardless, the Board directs Arctic to justify the scenario that is appropriate to use in the alternatives analysis.

- ***Decision #5: Arctic is to use the CMIP6 model in the cover alternatives analysis for the Point Lake WRSA. Submission of the cover alternatives analysis is to include justification for the selected climate scenario.***

### **3.4 Waste Rock Ore Management Plan**

The Waste Rock Ore Management Plan (WROMP) is the monitoring and management plan that describes the rock geochemistry and seepage monitoring that is conducted during the construction of the rock piles at Ekati. The GNWT-ECC (comment 6) and WLWB staff (comment 19) requested further clarity about the timing to update the WROMP to reflect the Point Lake project. Arctic stated that an updated WROMP that includes the Point Lake project would be submitted to the Board, for review and approval, following the approval of the Design Plan. The Board notes that Part H, Condition 3 of the Licence requires the WROMP to be submitted a minimum of 90 days prior to construction (excluding the basal layer that was previously authorized) and submission of the WROMP is not dependent on any approval of the Design Plan.

GNWT-ECC (comments 4 and 8), WLWB staff (comment 21), and IEMA (comment 8) commented on rock geochemistry and seepage quality monitoring for the Point Lake project. GNWT-ECC requested clarity on geochemical characterization and recommended confirmation sampling of construction material; WLWB staff inquired about the frequency of geochemical testing of waste rock; and IEMA recommended shallow ground water monitoring wells downstream of the WRSA to evaluate any seepage from the WRSA. Arctic responded to all comments and the Board is of the opinion that these responses should be considered through a public review. The Board is of the view that the monitoring of rock geochemistry and seepage associated with the Point Lake WRSA are best addressed within a revised WROMP that is submitted for approval by the Board. The Board requires Arctic to include a conformity table in its next submission of the WROMP that describes how each of the following comments have been addressed, or otherwise provide an explanation for why the comment was not further considered: GNWT-ECC comments 4 and 8, WLWB staff comment 21, and IEMA comment 8.

- ***Decision #6: Arctic is to include a conformity table in its next submission of the WROMP that describes how each of the following comments have been addressed, or otherwise provide an explanation for why the comment was not further considered: GNWT-ECC comments 4 and 8, WLWB staff comment 21, and IEMA comment 8.***

### 3.5 Final Cover Design

Several reviewers provided comments associated with the preliminary cover design, as presented in the Design Plan. The GNWT-ECC (comment 14) requested clarity on modelling assumptions and parameters and the Tłıchq Government (comment 17), WLWB staff (comments 9 and 10), and IEMA (comment 4) commented on operational monitoring and adaptive management. Arctic responded to all comments by providing additional information and recommended that these items be further considered with the Final Cover Design. The Board requires that these comments (included in Table 1) be addressed in the Final Cover Design. The Final Cover Design for the Point Lake WRSA is required by Part K, Condition 11 of the Licence.

The GNWT-ECC (comments 10 and 11) and IEMA (comment 9) also requested clarity on seepage modelling assumptions and parameters. GNWT-ECC (comment 10) sought rationale for the value used for infiltration and its sensitivity to the pile. GNWT-ECC (comment 11) requested clarity on model geochemical inputs used and why the maximum geochemical inputs were not considered in the climate change scenario. IEMA (comment 9) recommended the 0.5 scaling factor proposed to account for reduced contact water be removed or reconsidered in the modelling. Arctic responded to these comments by providing how modelling assumptions and parameters influenced the current assumptions and parameters but did not confirm these assumptions and parameters would be further considered in the Final Cover Design. The Board is of the opinion that the reviewer comments (included in Table 1) were relevant to the evaluation of cover performance and requires these comments to be addressed in the Final Cover Design, or otherwise provide an explanation for why the comment was not further considered.

The Tłıchq Government (comment 6) commented on the structural stability of the pile post-closure. Tłıchq Government asked about the appropriateness of the factors of safety once ditches are removed and water drains freely. Arctic's response indicated that the final closure design is not yet approved and some of those water management structures may remain. The Board requires Arctic to address Tłıchq Government comment 6 (included in Table 1) in the Final Cover Design, or otherwise provide an explanation for why the comment was not further considered.

- ***Decision #7: Arctic include a concordance table in the Final Cover Design that describes how each of the comments included in Table 1 have been addressed, or otherwise provide an explanation for why the comment was not further considered.***

### 3.6 Closure and Reclamation Plan

Tłıchq Government (comments 9, 14, 18 and 19) and IEMA (comment 1) provided comments or recommendations that pertain to closure and reclamation of the Point Lake WRSA. Closure topics raised included: Point Lake pit water quality at closure, overburden pile size and slope, use of peat and organics, and how evaluations presented by Arctic in this WRSA review will factor into closure of other rock piles at Ekati. The Board is of the opinion that these reviewer comments, which are summarized in Table 2, would be best addressed in Ekati's Closure and Reclamation Plan since these comments are broader in perspective than the purpose of the Design Plan and Seepage Prediction Report. The Board notes that

approval of the Design Plan does not provide approval for the final closure design of the overburden pile and that this detail needs to come at a later time when overburden use is better understood. Ekati's Closure and Reclamation Plan Version 3.1 includes the Point Lake project and is currently undergoing public review and subject to Board approval according to Licence Part K, Conditions 1 and 2. The Board requires Arctic to discuss with Board staff how best to address the items listed within Table 2 within the next Closure and Reclamation Plan.

- **Decision #8: Arctic to include a concordance table within the next Version of the Closure and Reclamation Plan, that describes how the comments in Table 2 have been addressed.**

**Table 1: Final Cover Design Requirements.**

| Number | Comment   | Recommendation   |
|--------|---|--|
| 1      | Tłjchq Government comment 6   | Assess the long-term stability with the configuration of the Final Cover Design.   |
| 2      | Tłjchq Government comment 12  | Include a professional opinion on the level of uncertainty on the infiltration and release rates. For the uncertainty that exists, detail the mitigations in place to mitigate the associated risk.  |
| 3      | Tłjchq Government comment 14  | Include an evaluation of acute toxicity guidelines into the modelling updates to support the final closure design for the WRSA.  |
| 4      | Tłjchq Government comment 10<br>WLWB staff comment 5<br>IEMA comment 5 and 14 | Include thermal modelling to consider a range of climate models that include a current climate model as well as a climate prediction that provides for a warmer than expected future climate.  |
| 5      | Tłjchq Government comment 17  | Include temperature monitoring of the pile during construction to inform Final Cover Design.   |
| 6      | WLWB staff comment 9 and 10   | Include adaptive management that considers monitoring thermal conditions of the WRSA and Seepage quality with associated low, moderate, and high triggers for mitigative measures.   |
| 7      | Tłjchq Government comment 12<br>WLWB staff comment 16                         | Include an updated hydrologic, hydrogeologic, and geothermal model used to predict seepage quality and quantity based on updated monitoring data on snow drifting at WRSA's, overburden physical properties, overburden geochemistry, metasediment geochemistry, WRSA seepage quality and quantity, overburden stockpile seepage quality and quantity, and receiving waters. |
| 8      | GNWT-ECC comment 10   | Evaluate the sensitivity of the infiltration rate in the Final Cover Design.   |
| 9      | GNWT-ECC comment 11   | Include average and maximum geochemical inputs for all model scenarios.  |

| Number | Comment             | Recommendation   |
|--------|---------------------|--|
| 10     | GNWT-ECC comment 12 | Assess the assumption of 70% natural water quality to 30% rock cover water quality in the cover design.                                |
| 11     | IEMA comment 2      | Include a discussion on the selection of cover thickness.  |
| 12     | IEMA comment 5      | Update the scaling factor for reduced contact of water with rock based on operational data at the Ekati Mine.                          |
| 13     | IEMA comment 8      | Include a discussion of in-situ conditions of collection channels to determine if a liner is required.                                 |
| 14     | IEMA Comment 9      | Confirm scaling factor in Final Cover Design is based on updated information from similar WRSA and the Point Lake WRSA, if applicable. |

**Table 2: Updates to the Closure and Reclamation Plan (CRP) to incorporate Point Lake.**

| Number | Comment  | Recommendation   |
|--------|--|--|
| 1      | Tłjchq Government comment 9                    | Include how Arctic will manage organics and peat in operations and closure.  |
| 2      | Tłjchq Government comment 14                   | Include water quantity and quality inputs from the Point Lake mine components, including the WRSA, in the assessment of the Point Lake open pit water quality during mine closure. |
| 3      | Tłjchq Government comment 18<br>IEMA comment 1 | Include final conditions of the overburden pile as part of the closure and reclamation plan.   |
| 4      | Tłjchq Government comment 19                   | Detail the closure objectives of WRSA covers.  |

**Signed the 6<sup>th</sup> day of November 2023, on behalf of the Wek'èezhìi Land and Water Board**



Mason Mantla  
Chair, Wek'èezhìi Land and Water Board



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