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May 21, 2019

W2012L2-0001

Harry O'Keefe
Dominion Diamond Mines ULC
900-606 4 Street SW
Calgary, Alberta T2P 1T1

Dear Harry O'Keefe,

Re: Jay Aquatic Effects Monitoring Program (AEMP) Version 1.0

The Wek'èezhìi Land and Water Board (WLWB or the Board) met on May 9, 2019 to consider the Jay Aquatic Effects Monitoring Program (AEMP) submitted by Dominion Diamond Mines ULC (Dominion) in accordance with Part J, Condition 2(c) and 8 (b) of Water Licence W2012L2-0001 (Licence).

As discussed in the attached Reasons for Decision, the Board has determined that additional analyses are required to address the outstanding concerns associated with the adequacy of baseline data. In consideration of all evidence and argument, the Board has determined that the Jay AEMP cannot be approved until the concerns raised with baseline data have been resolved. The Board has not approved the Jay AEMP and requires Dominion to submit Version 1.1 of the Jay AEMP (i.e., the Design Plan, Response Framework, and supporting documents) to incorporate Revisions A-M, as described in the attached Reasons for Decision. Dominion is to work with Board staff to establish a submission date for Version 1.1.

The Board acknowledges that the revised Jay AEMP will not be resubmitted and considered by the Board prior to open-water sampling in 2019. The onus is on Dominion to ensure that the baseline data available for the Jay AEMP is adequate. The Board encourages Dominion to use the upcoming open-water season as an opportunity to address any potential gaps and/or uncertainties with respect to baseline data adequacy.

Finally, it is unclear how the Jay AEMP may influence the existing approved AEMP for the Ekati site. Dominion is to propose all changes to the Ekati AEMP that will result from the Jay Project with the Re-evaluation Report to be submitted in December 2019.

Sincerely,

A handwritten signature in blue ink, appearing to read "J Mackenzie".

Joseph Mackenzie
Chair, Wek'èezhii Land and Water Board

Copied: Ekati Distribution List



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Reasons for Decision

Reference/File Number:	W2012L2-0001 (Type "A" Water Licence)
Licensee:	Dominion Diamond Mines ULC (Dominion)
Subject:	Jay Aquatic Effects Monitoring Program (AEMP)

Decision from the Wek'èezhìi Land and Water Board Meeting of May 9, 2019

1.0 Decision

At the Wek'èezhìi Land and Water Board's (WLWB or the Board) May 9, 2019 meeting, the Board met to consider the Jay Aquatic Effects Monitoring Program (AEMP) submitted by Dominion Diamond Mines ULC (Dominion) on March 9, 2018 as required by its Water Licence (W2012L2-0001) under Part J, Condition 2 (c) and 8 (b).¹

The Board has determined the following:

1. The Board has not approved the Jay AEMP Version 1.0;
2. Dominion is to submit Version 1.1 of the Jay AEMP (i.e., the Design Plan, Response Framework, and supporting documents) to incorporate Revisions A-M:
 - A. Dominion is to include additional/revised maps that provide a visualization of which baseline sites are going to be compared with which AEMP sites.
 - B. Dominion is to provide an appropriate analysis of the spatial variability of key water quality variables within Lac du Savage.
 - C. Dominion is to ensure the power analyses included in Version 1.1 of the Jay AEMP include all available and relevant baseline data.
 - D. Dominion is to update the timelines for the Jay Project to reflect the current mine plan.
 - E. Dominion is to revise the description of the data analysis and interpretation of AEMP data to clarify the following:

¹ See WLWB Online Registry at www.wlwb.ca for [W2012L2-0001 - Ekati - Water Licence - Apr 24 19.pdf](#)

- i. Which data will be utilized in the before-after-control-impact (BACI) analysis of AEMP data during the Discharge Phase (e.g., will the “before” data include any data collected after the commencement of dyke Construction);
 - ii. Which data will be utilized as “after data” during Construction and Discharge phases;
 - iii. How best professional judgement as described in section 8.3.2 will be used to identify spatial trends and how Dominion has considered the completion of a more formal evaluation of spatial trends in place of ‘best professional judgement’.
- F. Dominion is to include the following:
 - i. Commitment to include sediment coring methods in remaining baseline sampling and attempt the options suggested by the Board in its December 3, 2018 Reasons for Decision;
 - ii. Commitment to evaluate the results of data collected in Revision F(i) above, and discuss implications to the proposed sediment sampling program for the Jay AEMP; and
 - iii. Timeline of when the results of the commitments described in Revision F (i) and (ii) will be provided to the Board.
- G. To ensure that Dominion can determine whether a Significance Threshold is being approached, Dominion is to complete one of the following:
 - i. Revise section 4.3 of the Jay Response Framework to provide or reference evidence that demonstrates that changes to large-bodied fish survival, growth, reproduction, presence, and safety for consumption can be directly reflected by changes in Slimy Sculpin; or
 - ii. Propose the addition of large body fish sampling to the Jay AEMP; or
 - iii. Provide further rationale for why the inclusion of large-bodied fish in the Jay AEMP is not necessary given the Significance Threshold for fish.
- H. Dominion is to revise section 9 of the Baseline Report to include an evaluation of large-bodied fish, addressing requirements of Schedule 8, Condition 1(r)-(s).
- I. Dominion is to more clearly demonstrate how the Jay AEMP proposes to monitor and evaluate potential cumulative impacts of the Jay Project on Lac de Gras in the Jay AEMP Version 1.1.
- J. Dominion is to complete one of the following:
 - i. Propose a Low Action Level for total phosphorus that is specific to nutrient enrichment effects in Lac de Gras; or
 - ii. Propose its plan, including trigger(s) for submission, to develop a Low Action Level specific to nutrient enrichment effects in Lac de Gras. This would include rationale for why a Low Action Level is not being proposed at this time.
- K. Dominion is to:
 - i. Propose a Low Action Level for total phosphorus during the Construction phase of the Project; or

- ii. Provide evidence to demonstrate that no adaptive management of total phosphorus will be required prior to Discharge.
 - L. Dominion is to discuss potential impacts of dust on water quality and how the AQEMMP monitoring could integrate with the Jay AEMP.
 - M. Dominion is to provide one of the following:
 - i. Include a commitment to continue sampling at FF2 and the Coppermine River once/if Diavik sampling is discontinued; or
 - ii. Provide details of how Dominion will monitor and analyze cumulative effects in Lac de Gras once/if Diavik sampling is discontinued.
- 3. Dominion is to work with Board staff to determine an appropriate timeline for the submission of the Jay AEMP Version 1.1.
- 4. Dominion is to propose all changes to the Ekati AEMP that will result from the Jay Project with the Re-evaluation Report to be submitted in December 2019.

2.0 Background

Part J, Condition 2(c) requires Dominion to submit a revised Aquatic Effects Monitoring Program (AEMP) Design Plan to incorporate the Jay Development; the AEMP Design Plan must also satisfy the objectives of Part J, Condition 1 and requirements of Schedule 8, Condition 1. Part J, Condition 8(b) and Schedule 8, Condition 1(q), require the Licensee to submit a revised Response Framework that satisfies the requirements of Schedule 8, Condition 1(q).

A conceptual AEMP Design Plan for the Jay Development was submitted to the Mackenzie Valley Environmental Impact Review Board (Review Board) on June 1, 2015 as part of the Environmental Assessment process.

In June 2016, Dominion applied to the WLWB for a Type A Land Use Permit and amendment of the Ekati Water Licence to include the Jay Development. As part of Dominion's Water Licence Application for the Jay Project, Dominion submitted an AEMP Design Plan including a Response Framework, specific to the dyke Construction phase of the Jay Development (further referred to as the Jay Construction AEMP).² In review of the Jay Construction AEMP, the Board required Dominion to submit a revised AEMP Design Plan to incorporate both Construction and operation phases of the Jay Development.³

On March 9, 2018, Dominion submitted the following to satisfy the requirements of Part J, Condition 2 (c) and Condition 8(b):

- Jay AEMP – Design Plan (Construction and Operations)⁴
- Jay AEMP – Supporting Information⁵

² See WLWB Online Registry for [Ekati Jay Project - Appendix I - Jay Project AEMP Design Plan - Jun 7 16.pdf](#)

³ See WLWB Online Registry for [W2012L2-0001 - Ekati - Water Licence - Amendment - Jay Development - RFD and Recommendation to Minister - May 29 17.pdf](#); pg. 57

⁴ See WLWB Online Registry for [W2012L2-0001 - Ekati - AEMP - Jay Development - Design Plan - Mar 9 18.pdf](#)

⁵ See WLWB Online Registry for [W2012L2-0001 - Ekati - AEMP - Jay Development - Supporting Information - Mar 9 18.pdf](#)

- Jay AEMP – Baseline Data Summary (Baseline Report)⁶
- Jay AEMP – 2016 Fish Health Baseline⁷
- Jay AEMP – Hydrology Supplemental Report⁸
- Jay AEMP – Reference Lake Report⁹
- Jay AEMP – Response Framework¹⁰

The above documents will be referred to collectively as the Jay AEMP.

The Jay AEMP was distributed for public review on October 4, 2018. Reviewers were asked to provide comments by January 31, 2019. Comments, recommendations and/or clarifications were received from Diavik Diamond Mines 2012 Inc (DDMI), Environment and Climate Change Canada (ECCC), the Government of the Northwest Territories – Environment and Natural Resources (GNWT-ENR), and the Independent Environmental Monitoring Agency (IEMA); Board Staff also submitted questions. Fisheries and Oceans Canada (DFO) stated it had no comments. Proponent responses were due February 21, 2019. On February 4, 2019, the proponent response deadline was extended until February 28, 2019 in response to a request made by Dominion. Dominion submitted all responses by the deadline of February 28, 2019. Reviewer comments and recommendations, as well as proponent responses are available on the WLWB online registry.¹¹

The Board received expert advice from Hutchinson Environmental Sciences Limited to assist with its decision.

3.0 Reasons for Decision

The Jay AEMP was reviewed for conformity to the requirements set out in Part J and Schedule 8 of the Licence and the Board’s May 29, 2017 Reasons for Decision.¹² All reviewer comments and proponent responses submitted during the public review period were also reviewed. As discussed below, the Board believes additional analyses are required to address the outstanding concerns associated with the adequacy of baseline data. The Boards’ AEMP Guidelines¹³ state “if it is determined that there is insufficient baseline data to support the AEMP Design, approval may be delayed.” As discussed in section 3.1.1 of this Reasons for Decision, the Board was unable to make a determination on whether sufficient

⁶ See WLWB Online Registry for [W2012L2-0001 - Ekati - AEMP - Jay Development - Baseline Data Summary - Mar 9 18.pdf](#)

⁷ See WLWB Online Registry for [W2012L2-0001 - Ekati - AEMP - Jay Development - 2016 Fish Health Baseline Report - Mar 9 18.pdf](#)

⁸ See WLWB Online Registry for [W2012L2-0001 - Ekati - AEMP - Jay Development - Hydrology Supplemental Report - Mar 9 18.pdf](#)

⁹ See WLWB Online Registry for [W2012L2-0001 - Ekati - AEMP - Jay Development - Reference Lake Report - Mar 9 18.pdf](#)

¹⁰ See WLWB Online Registry for [W2012L2-0001 - Ekati - AEMP - Jay Development - Response Framework - Version 1.0 - Mar 9 18.pdf](#)

¹¹ See WLWB Online Registry for [W2012L2-0001 - Ekati - AEMP - Jay AEMP - Review Summary and Attachments - Feb 28 19.pdf](#)

¹² See WLWB Online Registry for [W2012L2-0001 - Ekati - Water Licence - Amendment - Jay Development - RFD and Recommendation to Minister - May 29 17.pdf](#)

¹³ [MVLWB/GNWT Guidelines for Aquatic Effects Monitoring Programs \(2019\)](#)

baseline data exists based on the evidence provided and believe additional analyses is required to complete this evaluation.

In consideration of all evidence and argument, the Board has determined that the Jay AEMP cannot be approved until the concerns raised with baseline data have been resolved because addressing outstanding concerns could result in changes to the AEMP Design and/or the Response Framework. The Board has thus limited discussion and direction below to key considerations for the submission of Version 1.1 of the Jay AEMP. The Board acknowledges that recommendations received during the public review regarding the Jay AEMP were not limited to the topics discussed below but expect that Parties' recommendations will be considered by Dominion in preparation of Version 1.1 of the Jay AEMP. The Board notes that Dominion's response to several Parties' comments and recommendations provided clarification on component/aspects of the Jay AEMP. Dominion should consider how these clarifications can be incorporated into the revised submission. In addition, Dominion made several commitments through this review that should be reflected Version 1.1.

- ***Decision #1: The Board has not approved the Jay AEMP Version 1.0.***
- ***Decision #2: Dominion is to submit Version 1.1 of the Jay AEMP (i.e., the Design Plan, Response Framework, and supporting documents) to incorporate Revisions A-M.***

The Board acknowledges that there are many factors that may influence an appropriate submission timeline (e.g., timeline required for analyses, Jay Development timelines etc.,) and are therefore requiring the Dominion to work with Board staff to determine an appropriate submission timeline.

- ***Decision #3: Dominion is to work with Board staff to determine an appropriate timeline for submission of the Jay AEMP Version 1.1.***

3.1 Baseline Data

In the Board's May 29, 2017 Reasons for Decision, the Board identified Parties' concerns with the adequacy of baseline data. As a result, the Board included requirements for the AEMP Design Plan to address this uncertainty (Schedule 8, Condition 1 (r)-(t) of the Water Licence). To address these requirements, Dominion submitted the Baseline Report¹⁴ as part of the Jay AEMP.

In review of the Jay AEMP, the GNWT-ENR again identified concerns with the baseline data and proposed additional analyses be completed to demonstrate that sufficient baseline data has been collected (GNWT-ENR comments 6, 7, and 11). The GNWT-ENR stated it "is of the opinion that Dominion has not adequately assessed and described variability [in] the baseline water quality data set" and recommended that Dominion assess the spatial variability of water quality variables within Lac du Savage for those datasets where multiple locations are available within a given year (GNWT-ENR comment 6).

¹⁴ See WLWB Online Registry for [W2012L2-0001 - Ekati - AEMP - Jay Development - Baseline Data Summary - Mar 9 18.pdf](#)

3.1.1 Pooling of Baseline Data

In section 9.1.1 of the Baseline Report, Dominion describes that water and sediment quality, plankton, and benthic invertebrate data collected from Lac du Sauvage is proposed to be pooled for use in the baseline dataset for comparison with AEMP near-field monitoring data. Schedule 8, Condition 1(s) requires Dominion to provide a description of comparisons to be made to baseline data for the Jay Development, including:

- i. identification of the baseline and proposed sampling stations, and parameters to be compared;
- ii. a description of why the baseline stations are considered comparable to the proposed stations;
- iii. a description of variability in each baseline data set; and
- iv. based on Schedule 6, Condition 1(s)(i-iii), an estimation of the magnitude of change that could be reliably detected in each planned comparison.

To address Schedule 8, Condition 1(s)(ii), Dominion describes that the proposed AEMP stations are located in the same general area as the baseline stations and on this basis, concludes that "the baseline and AEMP stations are considered comparable". Numerous maps are provided in the Jay AEMP to show the locations of baseline and proposed monitoring stations; however, because of the multiple maps, it is difficult to visualize how the baseline and the AEMP sampling sites compare spatially. Given the proposed pooling of baseline data and the phased approach to Jay AEMP sampling, the Board believes Dominion should provide updated map(s) which provide a visualization of how the baseline and the AEMP sampling sites compare spatially (i.e., which baseline sites are going to be compared with which AEMP sites). The Board notes that, if possible, a map overlaying the baseline and all proposed AEMP sites would be a useful addition to help describe how the sampling program is proposed to change through the three phases.

- ***Revision A: Dominion is to include additional/revised maps that provide a visualization of which baseline sites are going to be compared with which AEMP sites in the Jay AEMP Version 1.1.***

In addition, to further address Schedule 8, Condition 1(s)(ii) Dominion referred to the spatial variability box plots and summary statistics (Appendices A and B of Baseline Report) as a demonstration that the baseline stations can be considered comparable to the proposed monitoring stations. The evaluation of variability within the Lac du Sauvage baseline dataset is required by Schedule 8, Condition 1(s)(iii). As discussed in the following paragraphs, there were concerns/issues with the analysis.

To address Schedule 8, Condition 1(s)(iii), Dominion categorized Lac du Sauvage baseline data by location (i.e., as near-field¹⁵ or "other") and presented box plots and summary statistics for near-field and "other" data. While these appendices illustrate temporal trends of baseline data and provide a graphical comparison of near-field and "other" station data, they do not allow for a spatial comparison between individual stations because the sites are not labelled or organized according to their relative locations

¹⁵ Near-field area is defined as the lake area within 1.5 km of the proposed dike

within the lake.¹⁶ In other words, spatial trends may be present for some variables but this cannot be (easily) determined from an assessment of these figures. The Board understands that Dominion intends to use this comparison between near-field and “other” data to justify pooling data from the entire lake into a single baseline data set for future comparisons. The GNWT-ENR stated that the comparison of the two groups (i.e., near-field and “other”) provided does not comprise an assessment of spatial variability and described its expectations of the required assessment (GNWT-ENR comment 6):

Spatial variability is assessed by plotting/statistically analyzing comparable water quality samples (i.e. from the same depth strata, season and year so as to avoid those confounding effects) from different locations within Lac du Sauvage.

The GNWT-ENR specifically raised concerns about the spatial heterogeneity of nutrient parameters across all seasons and total dissolved solids (TDS) under ice (GNWT-ENR comment 6). In response, Dominion reiterated its opinion that sufficient baseline data has been collected and no further analyses are required; however, did not address the concerns raised by the GNWT-ENR regarding potential variability resulting from spatial, seasonal, or depth differences.

The Board understands that pooling of baseline data to increase the sample size used in baseline comparisons will influence the robustness of the baseline data set for future statistical comparisons. It is therefore important that pooling of baseline data is well supported. The Board agrees with the GNWT-ENR’s position that pooling of data must be supported by appropriate spatial analyses on parameters of concern (e.g., TDS, Turbidity, total suspended solids (TSS), and total phosphorus (TP)). The GNWT-ENR described that this spatial analysis could be completed statistically (e.g., gradient in the direction of net water flow) or graphically (e.g., contour plots; GNWT-ENR comment 6). The GNWT-ENR identified that this could be completed using datasets where multiple locations are available within a given year and confounding effects (i.e., depth strata and season) are controlled for (GNWT-ENR comment 7).

In response to the GNWT-ENR recommendations, Dominion stated:

- further assessment of spatial variability of baseline water quality is not required (GNWT-ENR comment 6);
- the requested information (i.e., spatial plot of water quality data for a given year stratified by depth and season) is already provided in Appendices A and B of the Baseline Data Report (GNWT-ENR comment 7); and
- that further assessment of spatial variability of baseline water quality is not required. Dominion is confident that the conclusions drawn from the entirety of information provided in Appendices A and B are sufficient and appropriate for demonstrating a lack of spatial variability in Lac du Sauvage (GNWT comment 7).

¹⁶ See WLWB Online Registry for [W2012L2-0001 - Ekati - AEMP - Jay Development - Baseline Data Summary - Mar 9 18.pdf](#); Appendix A and B

The pooling of near-field and “other” lake data assumes that the pooling of the baseline near-field data, and the pooling of baseline “other data”, whose sampling locations are not consistent, is appropriate. The graphical and statistical analyses provided appear to allow for a coarse identification of temporal and spatial differences between near-field and “other” sites; however, as explained by the GNWT-ENR do not allow for a spatial analysis at the scale/level needed to determine whether pooling of baseline data is appropriate (e.g., gradient in the direction of net water flow). Overall, the Board does not believe that Appendix A or B adequately assesses the spatial variability within the near-field or “other” datasets. While the Board acknowledges that the existing baseline data may be sufficient, an evaluation of the reasonableness of pooling Lac du Sauvage baseline data is not possible given the analyses provided and therefore it is not possible to conclude at this time whether additional baseline data may be required.

- ***Revision B: Dominion is to provide an appropriate analysis of the spatial variability of key water quality variables within Lac du Sauvage as part of the Jay AEMP Version 1.1.***

As previously discussed, the adequacy of baseline data has direct implications to the Board’s consideration of the Jay AEMP Design Plan. If the pooling of all nearfield and “other” baseline data from Lac du Sauvage baseline data is determined to be reasonable, then changing the location of the AEMP sites between baseline data collection and AEMP (operations and Construction phases) is unlikely to have a significant impact on the program’s ability to detect environmental effects. However, if the additional analyses suggest that pooling of the baseline data is not appropriate, the sample size of the data will be reduced and the ability of the AEMP to detect change at the proposed stations may be affected. As stated above, the Board does not believe the Jay AEMP can be approved until it is confident that adequate baseline data has been collected prior to Construction, to support the proposed program.

3.1.2 Future Baseline Data Collection

Section 9.4 of the Baseline Report identifies additional baseline data that will be collected prior to dyke Construction.

The GNWT-ENR recommended Dominion collect additional under-ice baseline data, stating that the number of samples should be driven by acceptable Type II error rates and effect sizes as defined by a power analysis (GNWT-ENR comment 13). The GNWT-ENR stated that it understands under-ice data had not been collected in the near-field of Lac du Sauvage since the Board’s May 29, 2017 Reasons for Decision. In response, Dominion clarified that additional under-ice baseline data were collected from near-field stations in 2018. The Board notes that it does not appear that the 2018 data was included in the power analysis completed by Dominion in its Baseline Report or that the availability of the 2018 data was considered in the GNWT-ENR’s comment. The Board believes Dominion should ensure that the power analyses included in the Jay AEMP are based on all available and relevant baseline data. This can be appropriately revised in submission of Version 1.1 of the Jay AEMP.

- ***Revision C: Dominion is to ensure the power analyses included in Version 1.1 of the Jay AEMP include all available and relevant baseline data.***

For discussion and direction related to baseline data for large-bodied fish, see section 3.5.

Throughout the Jay Development proceeding and the current Jay AEMP review, Dominion has been adamant that sufficient baseline data has been collected. The Board believes additional evidence is required to demonstrate that the baseline data collected will be sufficient to identify effects in both Construction and operation phases of the Development. The Board is of the view that the onus is on the Licensee to provide evidence that the baseline data collected will be sufficient to identify effects in both Construction and operation phases of the Jay Development. The Revisions required above address the need for Dominion to provide further analyses to demonstrate the adequacy of the baseline data. If the additional analyses indicate that further baseline sampling is required, this could lead to additional baseline monitoring being required prior to the start of Construction, which could delay Construction at the Jay Development. The Board acknowledges that the revised Jay AEMP will not be resubmitted and considered by the Board prior to open-water sampling in 2019. Thus, the Board believes that Dominion should use the upcoming open-water season as an opportunity to address any potential gaps and/or uncertainties with respect to baseline data adequacy.

Table 1.2-1 of the Supporting Information document provides an overview of Jay Development timelines. The Board notes that the timelines associated with the Jay Development have changed since the 2017 Water Licence Amendment, and it is unclear if the Jay Development is on track to commence dyke Construction in 2019 as identified. An understanding of Jay Development timelines is important to understand Dominion's opportunity to collect additional baseline.

- ***Revision D: Dominion is to update the timelines for the Jay Development to reflect the current mine plan in the Jay AEMP Version 1.1.***

3.2 Analysis and Interpretation of AEMP Data

In consideration of concerns associated with pooling of baseline data, it is important to consider how the baseline data will be used in evaluation of AEMP data. The proposed data analysis and interpretation of AEMP data is described in section 8.3 of the Supporting Information.¹⁷ This section describes the different analyses proposed during the three phases of the Jay Development; however, it is unclear how data collected following the commencement of dyke Construction will be used. The Board notes that the level of detail provided in this section is not sufficient to fully understand and evaluate the planned analyses. The Board has identified specific items that should be clarified in Version 1.1 of the Jay AEMP to assist reviewers.

- ***Revision E: In the Jay AEMP Version 1.1, Dominion is to revise the description of the data analysis and interpretation of AEMP data to clarify the following:***
 - i. Which data will be utilized in the before-after-control-impact (BACI) analysis of AEMP data during the Discharge Phase (e.g., will the "before" data include any data collected after the commencement of dyke Construction);***

¹⁷ See WLWB Online Registry for [W2012L2-0001 - Ekati - AEMP - Jay Development - Supporting Information - Mar 9 18.pdf](#)

- ii. ***Which data will be utilized as “after data” during Construction and Discharge phases;***
- iii. ***How best professional judgement as described in section 8.3.2 will be used to identify spatial trends and how Dominion has considered the completion of a more formal evaluation of spatial trends in place of ‘best professional judgement’.***

3.3 Implications to the Ekati AEMP

During the public review, Board staff identified that it was unclear how the Jay AEMP may influence the existing approved AEMP for the Ekati site (WLWB staff comment 3 and 5). Section 3 of the Jay AEMP Design Plan describes the site-wide Ekati AEMP and the existing AEMP sites within the King-Cujo Watershed that are relevant to the Jay AEMP. For example, Dominion identifies that Stations LdS1 and LdS2, which are located within the proposed dyked area, will no longer be sampled after the commencement of dyke Construction; however, the Jay AEMP does not propose how potential impacts of the King Pond Settling Facility (KPSF) on Lac du Sauvage will be measured throughout the life of the Jay Development (WLWB staff comment 5). In response to WLWB staff comment 5, Dominion identified that SNP station Jay-0016 will be used to monitor potential impacts. The Board notes that it is unclear whether Dominion is proposing Jay-0016 be added as a new site-wide AEMP station and no Parties have had an opportunity to comment on this change.

The Board believes that any changes to the Ekati AEMP that may result from the Jay Development can be most appropriately proposed and considered through the Re-evaluation Report to be submitted in December 2019.

- ***Decision #4: Dominion is to propose all changes to the Ekati AEMP that will result from the Jay Development with the Re-evaluation Report to be submitted in December 2019.***

3.4 Sediment Sampling

Over the life of the Ekati mine, the AEMP has used an Ekman sampler (to collect the top 2 cm of sediment) and/or a sediment corer (to collect the top 1 cm of sediment). In section 4.5.4 of the Design Plan, Dominion describes its proposed sediment quality sampling approach for the Jay AEMP stating, “Dominion intends to continue using an Ekman grab for sediment quality sampling to allow for direct comparisons with the baseline and reference sediment quality data for the Jay Project.”

The Board recently did not approve a change to Ekman-only sediment sampling for the Ekati AEMP sites and noted that there are potential solutions that would allow continued use of coring.¹⁸ In the Board’s December 3, 2018 Reasons for Decision, the Board considered sediment sampling methods for the Jay AEMP, stating that it “believes it will be able to make a more informed decision on the sediment sampling aspect during its consideration of the Jay AEMP.”

¹⁸ See WLWB Online Registry for [W2012L2-0001 - Ekati - AEMP - Sediment Sampling Equipment Change - Directive and Reasons for Decision - Dec 3, 2018.pdf](#)

In the Jay AEMP, Dominion describes that its 2017 efforts at sediment core sampling in Lac du Sauvage were unsuccessful due to difficult lakebed conditions making coring impractical. During the public review, IEMA requested that Dominion either use the sediment corer or a combination of the corer and the Ekman dredge sampler to collect sediment (IEMA comment 2).

During the public review, Dominion was asked whether it had attempted the options (e.g., changing coring equipment, compositing or reducing replication and reducing the number of sample locations) suggested by the Board in its December 3, 2018 Reasons for Decision (WLWB staff comment 7). Dominion responded that it had made an effort to find alternate corer devices but that they are either too heavy to operate or too light to penetrate the lakebed. In addition, Dominion stated that although it is possible that reducing replication or compositing samples could be done to reduce the overall number of samples to be collected, this reduction in sampling effort would reduce the statistical power and ability to detect change spatially. Dominion concluded that it did not believe a reduced sediment core sampling effort would provide additional value to the AEMP over the use of the Ekman to collect the number of replicates at the sites outlined in the Design Plan. Dominion advised that it will conduct further sediment coring and grab sampling prior to the first year of the Jay AEMP in an effort to evaluate the use of the corer at a subset of sites. Dominion stated that this option would identify specific locations where a corer can be used effectively and efficiently.

Section 9.4 of the Baseline Report describes that sediment sampling in Thonokied Lake and the near-field area in Lac du Sauvage will be completed prior to dyke Construction. It is unclear if this sampling is planned for the 2019 open-water season and when those results would be available to demonstrate whether/where a corer can be used effectively at Jay AEMP sites. The Board believes that Dominion should ensure that the outstanding sediment quality baseline data in Thonokied Lake and the near-field area in Lac du Sauvage includes collection using sediment coring and should attempt the options suggested by the Board in its December 3, 2018 Reasons for Decision as necessary. Dominion should outline when these additional baseline results will be provided to the Board and how it will evaluate the results and implications to the proposed sediment sampling methods for the Jay AEMP.

- ***Revision F: Dominion is to include the following in the Jay AEMP Version 1.1:***
 - i. Commitment to include sediment coring methods in remaining baseline sampling and attempt the options suggested by the Board in its December 3, 2018 Reasons for Decision; and***
 - ii. Commitment to evaluate the results of data collected in Revision F(i) above, and discuss implications to the proposed sediment sampling program for the Jay AEMP***
 - iii. Timeline of when the results of the commitments described in Revision F (i) and (ii) will be provided to the Board.***

3.5 Large Bodied Fish Sampling

In section 4.5.7 of the Jay AEMP Design Plan, Dominion proposes to monitor small-bodied fish (Slimy Sculpin) as a surrogate species for all fish, acknowledging that future revisions to the program may include large-bodied fish. During the public review, Dominion was asked to provide rationale for not sampling large-bodied fish in Lac du Sauvage and Lac de Gras (WLWB staff comments 10, 11, and 16).

The Board understands that one of the motivations behind the exclusion of large-bodied fish from the Jay AEMP Design Plan is related to concerns about the impact of lethal sampling to the large-bodied fish population (response to IEMA comment 5). Dominion stated that Slimy Sculpin sampling allows Dominion to respect the cultural importance of fish by potentially eliminating sampling impacts on large-bodied fish (response to WLWB staff comment 10). As previously discussed in consideration of the Sable AEMP, the Board understands that years of repeated lethal large-bodied fish sampling have been shown to have measurable effects on fish populations in small Ekati AEMP waterbodies.¹⁹ It is unclear, however, whether sampling effects on large-bodied fish populations would be expected or observed in larger lakes the size of Lac du Sauvage and Lac de Gras.

In section 4.3 of the Jay Response Framework, Dominion describes the Significance Threshold for fish as a “large-bodied fish species (lake trout, whitefish, or arctic grayling) in Lac du Sauvage that is unsafe to eat; or is unable to survive, grow, or reproduce, or is permanently lost from a watershed”. The Jay Response Framework states that “because large-bodied fish are not assessed as part of the AEMP, the determination of whether a Significance Threshold is being approached will be made by inferences and Response Plan actions based on small-bodied fish tissue chemistry data and calculated metrics from the small-bodied fish health component.” The proposed Response Framework does not currently provide or reference evidence showing that changes to large-bodied fish survival, growth, reproduction, presence, and safety for consumption can be directly reflected by changes in Slimy Sculpin. To support the exclusion of large-bodied fish sampling, the Board believes evidence is required to support this link. If evidence to support this relationship is not available, Dominion should propose the addition of large-bodied fish sampling to the Jay AEMP or provide further rationale for why the inclusion of large-bodied fish is not necessary given the proposed Significance Threshold for fish.

- ***Revision G: To ensure that Dominion can determine whether a Significance Threshold is being approached, Dominion is to complete one of the following revisions in Version 1.1 of the Jay AEMP:***
 - i. Revise section 4.3 of the Jay Response Framework to provide, or reference, evidence that demonstrates that changes to large-bodied fish survival, growth, reproduction, presence, and safety for consumption can be directly reflected by changes in Slimy Sculpin;***
 - ii. Propose the addition of large body fish sampling to the Jay AEMP; or***

¹⁹ See WLWB Online Registry for [W2012L2-0001 - Ekati - AEMP - Sable AEMP Design Plan - Version 1.1 - Directive and Reasons for Decision - Apr 21 17.pdf](#)

- iii. Provide further rationale for why the inclusion of large-bodied fish in the Jay AEMP is not necessary given the Significance Threshold for fish.**

Because Dominion has identified that future revisions to the program may include large-bodied fish, Dominion must ensure that sufficient baseline data exists for large-bodied fish. During the review period, IEMA recommended that the adequacy of the baseline data for harvestable fish species should be revisited to either fill the missing analytical data gaps and include selenium in the trout tissue contaminants analysis, or explain why these cannot be done with the available baseline data (IEMA comment 5). In response, Dominion stated that IEMA's suggestion that available fish tissue data are in some way insufficient for comparison to baseline, that there are data gaps, or that selenium levels in Lake Trout tissue cannot be tracked over time, is incorrect. Dominion stated that in the event a large-bodied fish survey was conducted, fish sampled from Lac du Sauvage would be compared to normal ranges defined using baseline and reference data. In addition, Dominion provided a description of existing baseline data available for large-bodied fish.

The Board notes that the Jay AEMP describes baseline and reference data available for large-bodied fish;²⁰ however, large-bodied fish were not included in the evaluation of baseline adequacy (section 9 of Baseline Report). Thus, it is unclear how the adequacy of baseline data for large-bodied fish was determined.

- **Revision H: Dominion is to revise section 9 of the Baseline Report to include an evaluation of large-bodied fish, addressing requirements of Schedule 8, Condition 1(r)-(s).**

3.6 Cumulative Effects

The AEMP Guidelines state that "AEMPs must be designed and implemented to provide data that can be used to assess cumulative effects and impact predictions". In addition, Schedule 8, Condition 1 (p) requires the Jay AEMP to include "an evaluation of the Project-related effects on the Receiving Environment that may contribute to cumulative effects in the region."

Section 8.5 of the Supporting Information describes how the proposed Design Plan will monitor inputs from Lac du Sauvage to Lac de Gras; however, it is unclear how that data will be used to assess or analyze potential for cumulative effects in Lac de Gras. The GNWT-ENR noted that "the lack of specific cumulative effects monitoring and analysis leaves uncertainty if cumulative impacts will be accurately assessed by Dominion" (GNWT-ENR comment 1). In addition, this section does not discuss how data from the far-field 2 (FF2) area of Lac de Gras and the Lac de Gras outlet (i.e., Coppermine River) will be used to evaluate cumulative effects.

The GNWT-ENR recommended the cumulative effects section be expanded to include a detailed explanation of how Dominion will monitor and analyze cumulative effects in Lac de Gras resulting from the Project, including trends in phosphorus and any other relevant project-related effects (GNWT-ENR

²⁰ See WLWB Online Registry for [W2012L2-0001 - Ekati - AEMP - Jay Development - Baseline Data Summary - Mar 9 18.pdf](#);

comment 1). The GNWT-ENR stated that this may include discussion on aspects of the existing or proposed monitoring programs, and rationale for the current spatial distribution of monitoring locations.

- **Revision I: Dominion is to more clearly demonstrate how the Jay AEMP proposes to monitor and evaluate potential cumulative impacts of the Jay Project on Lac de Gras in the Jay AEMP Version 1.1.**

3.6.1 Cumulative Effects - Phosphorus

Consideration of Potential Effects to Lac de Gras

As described in the May 29, 2017 Reasons for Decision, the primary concern raised by DDMI regarding cumulative effects was the potential for the Jay Development to impact chlorophyll *a* and total phosphorus (TP) concentrations in Lac de Gras. The Board stated that DDMI had not demonstrated that adverse effects were likely to occur, however it is imperative that an early warning system be implemented to identify changes from model predictions.²¹ The Board specifically stated:

Given the concerns raised with potential impacts of phosphorus on Lac de Gras, the Board expects that [Dominion] will propose a robust monitoring and adaptive management program to ensure that the Licensee is able to identify trends in phosphorus inputs to Lac de Gras, and identify differences from the modelled scenarios with adequate time to determine any mitigations that may be required (Schedule 8, Condition 1(p)).²²

The referenced modelling was used in the Board's determination that "cumulative effects of the Jay Project on Lac de Gras are not likely to be significant"²³. In addition, the Board stated "it is imperative that the Jay AEMP be sufficient to act as an early warning system of any differences from the modelled scenarios considered through this proceeding".²⁴ In review of the Jay AEMP, the GNWT-ENR stated that the Jay AEMP had not sufficiently demonstrated a robust monitoring and adaptive management program that meets the intent of the Board's May 29, 2017 Reasons for Decision (GNWT-ENR comment 1).

The proposed Low Action Level for TP is based on the lake-specific trophic status or baseline conditions of Lac du Sauvage. DDMI stated that the proposed Action Levels should be based on the expected eutrophication level response thresholds in Lac de Gras (DDMI comment 1). In response, Dominion described that the AEMP will track TP loadings through the Narrows, which will provide the information required for developing a Low Action Level to manage potential nutrient enrichment effects in Lac de Gras. The Board understands that Dominion plans to propose an additional TP Action Level specific to nutrient enrichment effects in Lac de Gras; however, it is unclear when and how this would be proposed.

²¹ See WLWB Online Registry for [W2012L2-0001 - Ekati - Water Licence - Amendment - Jay Development - RFD and Recommendation to Minister - May 29_17.pdf](#)

²² See WLWB Online Registry for [W2012L2-0001 - Ekati - Water Licence - Amendment - Jay Development - RFD and Recommendation to Minister - May 29_17.pdf](#) pg. 65

²³ See WLWB Online Registry for [W2012L2-0001 - Ekati - Water Licence - Amendment - Jay Development - RFD and Recommendation to Minister - May 29_17.pdf](#); pg. 65

²⁴ See WLWB Online Registry for [W2012L2-0001 - Ekati - Water Licence - Amendment - Jay Development - RFD and Recommendation to Minister - May 29_17.pdf](#); pg 65

Without a proposed Action Level related to nutrient enrichment effects in Lac de Gras, it is unclear how Dominion will adaptively manage phosphorus concentrations in Lac du Sauvage that have the potential to impact Lac de Gras.

- **Revision J: Dominion is to complete one of the following in Version 1.1 of the Jay AEMP:**
 - i. Propose a Low Action Level for total phosphorus that is specific to nutrient enrichment effects in Lac de Gras; or**
 - ii. Propose its plan, including trigger(s) for submission, to develop a Low Action Level specific to nutrient enrichment effects in Lac de Gras. This is to include rationale for why the Low Action Level is not being proposed at this time.**

Action Levels Prior to Discharge

The Jay AEMP Design proposes that water quality and hydrology will be monitored at the Narrows in all phases of the AEMP; however, TP is not proposed as an evaluated variable in the Construction or pre-Discharge phases. Similarly, the Response Framework proposes a TP Low Action Level for near-field sites and the Narrows during the Discharge phase; however, no TP Action Levels are proposed for the Construction or pre-Discharge phases. Dominion stated that the Construction and pre-Discharge monitoring will allow Dominion to reliably evaluate the baseline and pre-Discharge TP loading to Lac de Gras from the Narrows, well in advance of the Misery Pit Discharge to Lac du Sauvage (response to DDMI comment 1). This appears to suggest that pre-discharge concentrations would be comparable to baseline data.

During the public review, DDMI recommended Dominion include Action Levels for TP loadings to Lac de Gras for both the Construction and operations phases of the Jay Project (DDMI comment 1). The Board notes that DDMI did not specify why it believes TP Action Levels are required for the Construction and pre-Discharge phases. In response, Dominion disagreed that Action Levels for TP are required during the construction phase, stating:

Although there is potential that small increases in TP in Lac du Sauvage associated with particulate material sourced from dike construction may occur during construction activities, effects are expected to be small and localized to the area close to the dike (i.e., settle out before reaching the Narrows and thus have no or non-measurable effects to Lac de Gras). Similarly, during the early operations period when there is no Discharge from Misery Pit, there is no Project-related source of TP to Lac du Sauvage.

Dominion argued that TP increases in Lac du Sauvage from dyke Construction materials during Construction will be small and localized close to the dyke (response to DDMI comment 1). Dominion did not provide evidence to support the argument that TP concentrations during Construction will be similar to baseline. The Board notes that extensive modelling was completed as part of the Jay Project Proceeding and may be useful to consider when discussing anticipated pre-Discharge concentrations resulting from the Jay Project.

The AEMP Guidelines²⁵ state that “Action Levels must be set such that adaptive management actions can be taken in a timely way to ensure that significant adverse impacts to the receiving environment never occur.” Dominion has not provided sufficient evidence to demonstrate that adaptive management of phosphorus will not be required prior to Discharge, and therefore it is unclear whether an Action Level for TP is necessary during Construction.

➤ **Revision K: In submission of the Jay AEMP Version 1.1, Dominion is to:**

- i. Propose a Low Action Level for total phosphorus during the Construction phase of the Project; or**
- ii. Provide evidence to demonstrate that no adaptive management of total phosphorus will be required prior to Discharge.**

Dustfall

DDMI requested that Dominion demonstrate it can quantify all TP loadings, including airborne loadings, from the Jay Project and other Ekati sources to Lac de Gras (DDMI comment 1). In section 9 of the Supporting Information, Dominion notes that results of the Air Quality and Emissions Monitoring and Management Plan (AQEMMP) may also be considered in terms of potential effects of dust deposition on surface water quality. In WLWB staff comment 21, Dominion was asked how the AEMP would detect dust-related impacts and how data from the AQEMMP could be used to better understand impacts from dusting on water quality. In response, Dominion stated that it anticipates Project-related sources of dust to be small and not measurable on their own, and that the AEMP is designed to evaluate the short- and long-term effects of the Project on the Receiving Environment, along with cumulative impacts from multiple sources. The Board believes the integration of AQEMMP and AEMP monitoring have not been sufficiently discussed for the purposes of assessing cumulative effects. Dust-related impacts and their potential for adverse cumulative impacts to Lac du Sauvage and Lac du Gras have not been adequately identified or predicted and mitigation actions for dust-related inputs have not been identified.

➤ **Revision L: Dominion is to discuss potential impacts of dust on water quality and how the AQEMMP monitoring could integrate with the Jay AEMP as part of Version 1.1 of the Jay AEMP.**

3.6.2 Diavik Sampling Locations

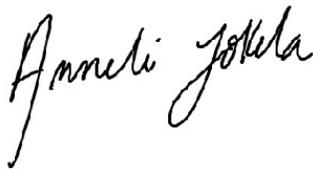
The Jay AEMP Design Plan proposes monitoring to be conducted in the FF2 area of Lac de Gras and the Lac de Gras outlet (i.e., Coppermine River) to capture potential cumulative effects in Lac de Gras resulting from flow through the Narrows from Lac du Sauvage. The Diavik Mine currently monitors the FF2 and Coppermine sites. Dominion states that Diavik operations are scheduled to cease in 2024, corresponding to approximately Year 2 of operations and “Dominion will consider sampling water quality and plankton in the FF2 area beginning Year 2 of operations if DDMI intends to cease sampling”. In response to WLWB staff comment 23, Dominion described that it is anticipated it will continue water quality monitoring at this location once DDMI discontinues monitoring. It is unclear under what circumstance Dominion would not undertake the monitoring currently conducted at FF2 and the Coppermine River. Because the

²⁵ [MVLWB/GNWT Guidelines for Aquatic Effects Monitoring Programs \(2019\)](#)

discontinuation of DDMI sampling is beyond Dominion's control, the Board is of the opinion that Dominion should include a commitment to continue monitoring in the proposed AEMP or demonstrate why data collection at these sites will not be required.

- **Revision M: Dominion is to provide one of the following in the Jay AEMP Version 1.1:**
 - i. Include a commitment to continue sampling at FF2 and the Coppermine River once/if Diavik sampling is discontinued; or**
 - ii. Provide details of how Dominion will monitor and analyze cumulative effects in Lac de Gras once/if Diavik sampling is discontinued.**

Signed the 21st day of May 2019, on behalf of the Wek'èezhii Land and Water Board



Witness



Joseph Mackenzie
Chair, Wek'èezhii Land and Water Board