



Box 32, Wekweètì, NT X0E 1W0
Tel: 867-713-2500 Fax: 867-713-2502

#1-4905 48th Street, Yellowknife, NT X1A 3S3
Tel: 867-765-4592 Fax: 867-765-4593
www.wlwb.ca

May 6, 2019

W2015L2-0001

Sean Sinclair
Diavik Diamond Mines (2012) Inc.
P.O. Box 2498, 300, 5102 – 50th Avenue
Yellowknife, NT X1A 2P8

Dear Sean Sinclair,

Re: A-Portal Waste Rock Mishandling Investigation Summary Report

The Wek'èezhìi Land and Water Board (WLWB) met on April 17, 2019 and considered Diavik Diamond Mines (2012) Inc.'s (DDMI) A-Portal Waste Rock Mishandling Investigation Summary Report.

The Board is of the view that in order to enable DDMI to confirm that mishandled rock is not problematic during operations and will not be problematic post-closure, the following should be improved: the documentation of mishandled waste rock; monitoring and reporting of monitoring results; and the response framework. The Board has therefore required revisions to several Water Licence submissions. Please review the attached Reasons for Decision for further information.

Sincerely,

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

Joe Mackenzie
Chair, Wek'èezhìi Land and Water Board

Copied: DDMI Distribution List



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Reasons for Decision

Reference/File Number:	W2015L2-0001
Licensee:	Diavik Diamond Mines (2012) Inc. (DDMI)
Subject:	A-Portal Waste Rock Mishandled Rock Report

Decision from the Wek'èezhìi Land and Water Board Meeting of April 17, 2019

1.0 Decision

On April 17, 2019, the Wek'èezhìi Land and Water Board (the Board) considered Diavik Diamond Mines (2012) Inc.'s (DDMI) A-Portal Waste Rock Mishandling Investigation Summary Report (the Mishandled Rock Report).¹ In consideration of the submission, past Board directives, reviewer comments, and proponent responses, the Board requires DDMI to:

1. Include a map/figure in Version 4.1 of the Closure and Reclamation Plan showing areas where A-Portal rock has been placed in roads and laydown pads.
2. Identify in Version 4.1 of the Closure and Reclamation Plan that the PKC barge road contains Type III rock and provide DDMI's rationale for why the Type III rock will be left in the PKC barge road.
3. Include a map in the Waste Rock Management Plan that shows all 10 areas that received mishandled rock, drainage directions, and SNP stations.
4. Revise the appropriate sections of the Waste Rock Management Plan to state that DDMI will conduct a Seepage Survey of all constructed areas, including each of the 10 areas referred to in Decision #3.
5. Include the following sentence in the appropriate section of the Waste Rock Management Plan: "Should new seepage generation be identified at the A21 laydown, A21 light vehicle roads, A21 haul roads, A21 light vehicle access road, or the Pond 3 pipe bench, seepage sampling would

¹ See WLWB Online Registry (www.wlwb.ca) for [Diavik - Waste Rock Misclassification - Investigation Summary Report - Oct 4 18.](#)

commence, and, if seepage is consistently detected, DDMI will propose an additional SNP station for the Board's consideration."

6. Develop a new set of action levels that are not based on MDMER limits and better reflect approved closure objectives SW1 and SW2.
7. Clarify that action levels apply to all active water bodies within the Drainage Control and Collection system and to all detected seepage/runoff.
8. Revise Response Level 3 to read: "Investigate additional seepage control/source control (e.g., relocate waste rock) and/or treatment options".
9. Add to Response Level 3 that "Should an action level 3 be triggered, the results of the investigations and any proposed mitigations will be submitted to the Board for review in the subsequent Seepage Survey Report."
10. Include the action levels and responses (including the revisions in Decisions #7 to #10) in the Waste Rock Management Plan.
11. Propose wording for Schedule 6, Condition 5 to require action levels and responses when it submits the next Version of the Waste Rock Management Plan.
12. Include results of monitoring of each of the 10 areas referred to in Decision #3 and any action level exceedances and responses taken in a dedicated section in the annual Seepage Survey Report.

2.0 Background

At the Diavik Mine, kimberlite and waste rock mined during underground operations are transported to the surface and placed on one of three portal pads (temporary storage areas) before being taken to the processing plant or the Waste Rock Storage Area. The A-Portal is one of the temporary storage areas and is located on the 270 Bench in the A418 Pit. On May 4, 2017, Diavik Diamond Mine (2012) Inc. (DDMI) notified the Government of Northwest Territories - Department of Lands (GNWT-Lands) Inspector that waste rock originating from the A418 underground operations and placed at the A-Portal temporary storage area was wrongly classified in surface reports as Type I rock when underground reports had classified this rock as a mixture of Type I and Type III rock.² On July 3, 2017, DDMI submitted the Waste Rock Misclassification Report to the Inspector and copied the WLWB.³ The Waste Rock Misclassification Report confirmed that DDMI had mistakenly mixed Type III waste rock with Type I waste rock and used the mixture in Construction. It described the investigation methodology and findings and included an action plan. The Board reviewed the Waste Rock Misclassification Report based on the implications of waste rock mishandling to Water Licence requirements, and on October 24, 2017, directed DDMI to submit information regarding DDMI's action plan, with a focus on how the mishandling of rock impacts Water Licence submissions.⁴

² See WLWB Online Registry for [Diavik - Notification - DDMI Letter to Inspector - Re Waste Rock Misclassification - May 4 17.](#)

³ See WLWB Online Registry for [Diavik - Waste Rock Misclassification - Report - Jul 3 17.pdf.](#)

⁴ See WLWB Online Registry for [Diavik - Waste Rock Misclassification - Board Directive - Oct 24 17.](#)

DDMI submitted the Diavik A-Portal Waste Rock Mishandling Investigation Summary Report (the Mishandled Rock Report) on October 4, 2018. The Report presents the outcomes and actions taken to address the A-Portal waste rock mishandling incident and the Board's October 24, 2017 direction.

The Mishandled Rock Report was distributed for public review on October 25, 2018 and reviewer comments were due by January 30, 2019. Reviewers were advised that the Board would review the submission based on the implications of waste rock mishandling to Water Licence requirements such as closure and monitoring, rather than from a compliance perspective. Comments were received from the Government of the Northwest Territories – Environment and Natural Resources (the GNWT-ENR or ENR); Board staff also submitted questions. The proponent response deadline was extended from February 8, 2019 to February 13, 2019 in response to a request by DDMI. DDMI submitted responses on February 13, 2019. Reviewer comments and recommendations, as well as the proponent's responses are available on the WLWB Online Registry.⁵

3.0 Reasons for Decisions

The Board's October 24, 2017 direction required DDMI to establish a more robust monitoring program; propose action levels and corresponding actions; describe reporting; and provide other information related to the mishandling of waste rock. The Board also requested that DDMI identify changes to Water Licence submissions that may result from the waste rock mishandling investigation. DDMI provided the information in the Mishandled Rock Report as per the Board's requirements; in the cover letter, DDMI identified the Closure and Reclamation Plan, Waste Rock Management Plan, and Water Management Plan as plans which have been or could potentially be updated based on the waste rock mishandling investigation.

In the Mishandled Rock Report, DDMI concluded that, based on its investigation and conservative estimates of how much mishandled rock was used in construction, "all areas constructed with A-Portal waste rock remained well within the classification range for Type I rock" and that "acid rock drainage and metal leaching is expected to remain within the normal range for Type I rock". DDMI also emphasized that seepage has never been detected from any of the constructed areas that received A-Portal waste and provided an explanation for why observable water is not expected through this rock.

Nonetheless, as explained further below, the Board is of the view that documentation of mishandled waste rock, monitoring and reporting of monitoring results, and the response framework, should be improved. This will enable DDMI to confirm that mishandled rock is not problematic during operations (for example, that contaminated seepage is not being released to the receiving environment) and will not be problematic post-closure. To achieve this, several Water Licence submissions would require revisions and the Waste Rock Management Plan Schedule would need to be updated, as illustrated in Table 1.

⁵ See WLWB Online Registry for [Diavik - Waste Rock Misclassification - Investigation Summary Report - Review Summary and Attachments - Apr 4 19](#).

Table 1. Topics and Submissions Requiring Revisions

Topic	Water Licence Submission Requiring Revisions	Section of Reasons for Decision
Documentation of Waste Rock Mishandling	<ul style="list-style-type: none"> • Interim CRP Version 4.1 • Waste Rock Management Plan 	Section 3.1
Monitoring Improvements	<ul style="list-style-type: none"> • Waste Rock Management Plan 	Section 3.2
Action Levels and Responses	<ul style="list-style-type: none"> • Waste Rock Management Plan 	Section 3.3
Reporting	<ul style="list-style-type: none"> • Seepage Survey Report 	Section 3.4
Other Requirements from the October 24, 2017 Board direction	NA	Section 3.5

The remainder of these Reasons for Decision is structured by the topics in Table 1 and describe the reasons for the Board’s decisions. To facilitate tracking of revisions for the different Water Licence submissions, a list of the required revisions has been compiled in Attachment #1.

3.1 Documentation of Waste Rock Mishandling

A-Portal rock was used in construction of the following A21 areas: the A21 laydown; A21 light vehicle roads; A21 haul roads; A21 light vehicle access road; and the Pond 3 pipe bench. Documentation of these areas in relevant Water Licence submissions is discussed below.

3.1.1 Documentation in the Closure and Reclamation Plan

During the public review, the GNWT-ENR commented that documentation of the locations of Type III rock used in construction will be useful in determining areas of priority at closure (GNWT-ENR comment 2). DDMI agreed that there is value in keeping a record of these areas, although DDMI stated that it is unlikely that the amounts of Type III rock (0.03% of waste rock on site) incorporated in A-Portal Type III rock areas would warrant prioritizing closure measures to those areas. Currently, the interim Closure and Reclamation Plan (Version 4.0) does not report where A-Portal waste rock has been used in surface construction. The next version of the interim CRP (Version 4.1) is due December 19, 2019.⁶ If elevated metal concentrations are observed in seepage from A21 areas following closure, it will be important to have a record of areas that received mishandled rock. Therefore, the Board is of the view that DDMI must revise the Closure and Reclamation Plan to identify the locations of mishandled waste rock.

- ***Decision #1: The Board requires DDMI to include a map/figure in Version 4.1 of the Closure and Reclamation Plan showing areas where A-Portal rock has been placed in roads and laydown pads.***

⁶ See WLWB Online Registry for [Diavik – Closure and Reclamation Plan – Version 4.1 – Extension Request – Decision Letter – Apr 17 19](#).

In addition, according to the Mishandled Rock Report, some mishandled A-Portal waste rock was used to construct the North Dam of the Processed Kimberlite Containment (PKC) Facility and the PKC barge dam road. Under the current Waste Rock Management Plan, Type III waste rock is approved for use in the North Dam of the PKC, but not in the barge road. In Section 1 of the Mishandled Rock Report, DDMI stated that use of Type III rock in the barge road “may be acceptable pending demonstration that the material will remain non-oxidized and within the lined facility following closure.” DDMI was asked how it would demonstrate that the material would remain non-oxidized, and to describe the implications if the material is shown not to remain oxidized (WLWB staff comment 1). In response, DDMI stated that because the waste rock material used will be contained in 9 m to 15 m of saturated fine processed kimberlite within the PKC Facility, oxidation is not anticipated to occur, and if oxidation were to occur, DDMI does not anticipate that the bulk facility seepage chemistry would change because the material accounts for 0.01% of the total material in the PKC Facility. Although problematic seepage from the PKC barge road appears to be unlikely, the Board is of the view that there should be a record of this material in the Closure and Reclamation Plan in case closure plans change such that the material will not be saturated or elevated metals are detected post-closure.

- ***Decision #2: The Board requires DDMI to identify in Version 4.1 of the Closure and Reclamation Plan that the PKC barge road contains Type III rock and provide DDMI's rationale for why the Type III rock will be left in the PKC barge road.***

3.1.2 Documentation in the Waste Rock Management Plan

As required by the Water Licence Schedule (Schedule 6, Condition 5c), seepage monitoring is described in Section 3.2.4 of the Waste Rock Management Plan (WRMP).

The Board’s October 24, 2017 direction required DDMI to provide maps indicating direction of potential water flows from the areas containing the mishandled waste rock. This can inform where the company and Inspector look for seeps during Seepage Surveys and inspections. If seepage is detected and sampled, this map can also inform the interpretation of sampling results.

The Board also required DDMI to confirm that “seepage from the areas that received mishandled rock is collected and cannot be released to the environment”. DDMI provided a figure that shows ‘Watersheds and Collection Ponds’ with SNP locations and flow directions for the site. The figure did not provide arrows indicating flow direction from the areas that received mishandled waste rock, and from the shading on the figure it was not apparent whether the areas that received A-Portal waste rock would have the potential to discharge to the receiving environment. In the Mishandled Rock Report, DDMI stated that “seepage from the areas that received A-Portal waste rock is not released to the environment.”

GNWT-ENR commented on this statement from DDMI, indicating there are A21 construction areas which are not within DDMI’s Drainage Control and Collection System, and noting that potential runoff from the A21 laydown areas to the west of the Haul Road would be released into the environment and not flow into the A21 Pit. GNWT-ENR asked DDMI to provide a rationale for the statement that seepage from A-Portal waste rock is not released to the environment (GNWT-ENR comment 10). DDMI was also asked

to describe the direction water flows from each of the ten areas that received A-Portal rock and identify where seepage from each area reports (WLWB staff comment 5).

In response to the GNWT-ENR's comment, DDMI maintained that no seepage has been observed from the areas identified by the GNWT-ENR, and that "there is no evidence to suggest the small proportional contribution of A-Portal material would significantly impact potential drainage chemistry outside of what is currently predicted for Type I rock in these areas." DDMI committed to monitoring these areas as part of the Seepage Survey, the results of which "will provide ongoing evidence to support or disprove this conclusion" (see DDMI's response to GNWT-ENR comment 10).

In response to WLWB staff comment 5, DDMI provided an informative description of the direction of potential runoff for each of the 10 areas that received mishandled A-Portal waste rock. To ensure there is a good record of drainage directions from areas constructed with mishandled rock and how they relate to the SNP station, a map showing all 10 areas that were constructed with mishandled rock, SNP stations, and the drainage directions from each area should be included in the WRMP.

- ***Decision #3: The Board requires DDMI to include a map in the Waste Rock Management Plan that shows all 10 areas that received mishandled rock, drainage directions, and SNP stations.***

3.2 Monitoring Improvements

One of the Board's requirements was that DDMI provide a description of a more robust monitoring effort, with the objective of detecting elevated metals or acidity in seepage/runoff from areas that received A-Portal waste rock in order to determine whether a response action is necessary. DDMI indicated in its response to this requirement that current Seepage Surveys are sufficient for monitoring areas that received A-Portal waste rock and that results indicating the possibility of rock oxidation will be discussed in the annual Seepage Survey Report. The Seepage Survey Report is required by Part H, Condition 16 of the Water Licence. The corresponding Schedule (Schedule 6, Condition 6) requires monitoring of seepage from "all mine components including: constructed rock piles, stockpiles of Reclamation rock, ore stockpiles, areas constructed with mined or quarried rock..."

The seepage monitoring section in Section 3.2.4 of the WRMP Version 8.1 says: "Seepage surveys will be conducted weekly around the toe of the [Waste Rock Storage Area-South Country Rock Pile (WRSA-SCRP)] and [WRSA-North Country Rock Pile (WRSA-NCRP)]." The Plan does not mention seepage surveys of areas constructed with mined or quarried rock (as required by Part H, Condition 15) or mishandled Type III waste rock. The Board believes that the WRMP should explicitly mention that monitoring will occur at all areas constructed with mined or quarried rock, including all areas where DDMI placed mishandled waste rock.

- ***Decision #4: The Board requires DDMI to revise the appropriate sections of the Waste Rock Management Plan to state that DDMI will conduct a Seepage Survey of all constructed areas, including each of the 10 areas referred to in Decision #3.***

DDMI indicated in the Mishandled Rock Report that potential drainage from the A21 laydown and roads is expected to flow into the A21 Pit, and seepage or runoff from these locations will be monitored at the current active SNP station. The GNWT-ENR commented on the adequacy of the current SNP network noting that the only SNP station within the A21 Pit appears to be a sump that will receive water from several sources, which would make it difficult to identify water from the areas affected by A-Portal misclassified Type III rock (GNWT-ENR comment 5). The GNWT-ENR recommended that DDMI establish a dedicated SNP monitoring point if seepage is consistently identified in this area. DDMI responded that there has been no observed flow from these areas to date and that similar areas on site have not historically had flow. DDMI therefore suggested that new SNP stations would be activated dependent on the specific situation with input from the Inspector. The Board agrees with the GNWT-ENR that if seepage is consistently identified in an area where there is mishandled rock, a dedicated SNP monitoring station should be established so that monitoring data can be collected and compared to action levels.

- ***Decision #5: The Board requires DDMI to include the following sentence in the appropriate section of the Waste Rock Management Plan: “Should new seepage generation be identified at the A21 laydown, A21 light vehicle roads, A21 haul roads, A21 light vehicle access road, or the Pond 3 pipe bench, seepage sampling would commence, and, if seepage is consistently detected, DDMI will propose an additional SNP station for the Board’s consideration.”***

3.3 Action Levels and Responses

The Board’s October 24, 2017 direction required DDMI to submit information on action levels and responses that may be taken if action levels are exceeded. DDMI proposed three action levels and three corresponding response levels.⁷ Action levels and responses are discussed below, followed by a discussion on which Water Licence submission should house the action levels and responses.

3.3.1 Action Levels

DDMI’s proposed action levels 1 and 3 refer to *Metal and Diamond Mining Effluent Regulation* (MDMER) limits. The MDMER limit for nickel is 0.5 mg/L. In comparison, the approved Aquatic Effects Monitoring Program (AEMP) benchmark for nickel is 0.025 mg/L and the Effluent Quality Criteria (EQC, maximum) is 0.05 mg/L.

The GNWT-ENR commented that the MDMER limit is “too high to address mishandled waste rock and reasoned that “since seepage will persist into closure, action levels should align with closure criteria” (GNWT-ENR comment 7). The GNWT-ENR acknowledged closure criteria are not fully developed yet and recommended that “comparison against existing effluent discharge limits could be considered as a screening tool.” The GNWT-ENR recommended that DDMI develop new action levels that don’t rely on MDMER limits (GNWT-ENR comment 7).

In response to GNWT-ENR comment 7, DDMI stated:

⁷ See WLWB Online Registry for [Diavik - Waste Rock Misclassification - Investigation Summary Report - Oct 4 18, see pgs. 23-24.](#)

DDMI generally agrees with ENR's view that action level trigger concentrations should align with closure criteria and that closure criteria have not yet been approved for DDMI to use. DDMI also agrees that Water License EQC could be used as some form of "screening tool"; however, the WLWB Directive requires specific action levels which are not the same as a "screening tool". ENR states that MDMER guidelines are not appropriate action level triggers but does not provide rationale for this conclusion. MDMER guidelines are national standards applicable to mine discharges to the environment with discharge rates as low as 50 m³/d. In the absence of approved closure criteria, it is DDMI's opinion that MDMER guidelines are the most appropriate limits for seepage/runoff that discharges to the environment at a rate of greater than 50 m³/d.

In response to WLWB staff comment 8 about the rationale for using MDMER limits, DDMI also stated that:

The MDMER guidelines are applicable to the Diavik mine site and in the absence of a site-specific criteria it is more appropriate than the operational EQC or AEMP benchmark. It is recognized that closure performance criteria are under-development for surface runoff/seepage and when approved could replace MDMER as a site-specific criteria for surface runoff. Once these site-specific criteria are approved, DDMI would recommend that the action levels be revised, provided they are lower than MDMER.

The Board agrees with DDMI and the GNWT-ENR that closure criteria are the most appropriate basis for action levels for WRSA seepage. However, much work remains for DDMI to finalize closure criteria, as directed by the Board in its Reasons for Decision for interim CRP Version 4.0.⁸

The Board previously advised against the use of MDMER limits (at the time they were called MMER limits)⁹ as closure criteria in its Reasons for Decision for Version 1.0 of DDMI's WRSA Closure and Reclamation Plan:

The Board concludes that MMERs are not based on protection of aquatic life, but on best available technology, and agrees that DDMI has not demonstrated that MMERs are consistent with DDMI's approved closure objectives. Further, the *MVLWB Water and Effluent Quality Management Policy* set out the Boards' objectives in regulating the deposit of waste:

"Protection of water quality in the receiving environment is the primary objective. The level of protection will be defined by the water quality standards that have been set site-specifically for the receiving environment in question." (page 10)

⁸ See WLWB Online Registry for Section 3.6 of [Diavik - Closure and Reclamation Plan Version 4.0 - Board Decision Letter and Reasons for Decision - Dec 17 18.pdf](#).

⁹ These limits were historically known as Metal Mining and Effluent Regulations (MMER) limits until last summer when diamond mines were added to the Regulations.

Based on the evidence provided to date, the Board concludes that MMERs are not appropriate closure criteria.¹⁰

If MDMER limits are not appropriate action levels and closure criteria are not developed, the question then is, what should the action levels be until closure criteria are final?

DDMI was asked to “discuss the pros/cons of using an action level that is based on the Water Licence EQC and/or the AEMP benchmark” (WLWB staff comment 8). DDMI responded in part that EQC are developed “for treated effluent released at a rate of more than 60,000 m³/d to Lac de Gras through an engineered diffuser such that it would not adversely impact aquatic life or drinking water.” DDMI concluded that “there is no scientific basis to apply a limit derived for a discharge rate of greater than 60,000 m³/d to a discharge rate of less than 50 m³/d.” The Board agrees that because EQC are based on a dilution rate associated with the diffuser, they are not appropriate to be used directly as action levels.

DDMI also objected to the use of AEMP benchmarks as action levels:

The AEMP benchmark was developed to describe a threshold concentration in Lac de Gras, outside of the mixing zone, below which aquatic life and drinking water quality are assumed to be protected. The AEMP benchmark was specifically derived for use with the AEMP action levels where they are compared with AEMP monitoring results from all monitoring locations in Lac de Gras that are outside the treated effluent mixing zone. There is no scientific basis to apply a limit derived for Lac de Gras outside the mixing zone to a runoff/seepage adjacent to mine infrastructure. Direct application of EQC or AEMP benchmarks with no scientific basis could result in required corrective actions that are not commensurate with the intended or appropriate level of environmental protection. DDMI has been engaged with communities and regulators for more than 20 years and at no time has any Party suggested equivalency between protection of aquatic life in Lac de Gras and protection of aquatic life or drinking water in runoff/seepage adjacent to mine infrastructure. DDMI acknowledges an advantage of using the AEMP benchmark or Water License EQC as action levels is convenience/expediency in that they are approved standards. However, as described above AEMP Benchmarks and Water License EQC were not derived for application to surface runoff/seepage and it is DDMI's opinion that it would be inappropriate to use either as action levels (DDMI response to WLWB staff comment 8).

It is not entirely clear whether AEMP benchmarks may inform action levels, even if, for the reasons DDMI has identified, they cannot be used as they are. Regardless, the Board is of the view that DDMI should propose action levels that are more connected to the closure objectives for seepage and runoff, which are:

- SW1: Surface runoff and seepage water quality that is safe for humans and wildlife
- SW2: Surface runoff and seepage water quality that will not cause adverse effects on aquatic life or water uses in Lac de Gras or the Coppermine River.

¹⁰ See WLWB Online Registry for [Diavik - 2015 CRP Progress Report - Directive - Oct 25 16.pdf](#).

DDMI should consider these objectives when revising the action levels. The Board is of the view that revising the action levels is unlikely to require time-consuming technical work such as new water quality modeling or risk assessment work. Rather, DDMI should develop a reasonable method for deriving temporary action levels (until closure criteria are finalized) that better relate to approved closure objectives. DDMI can draw on work it has already performed to develop closure criteria, Board direction on DDMI's proposed closure criteria for these two objectives, and reviewer comments on its proposed action levels. As discussed in Section 3.3.3, revised action levels should be proposed in the Waste Rock Management Plan.

- ***Decision #6: The Board requires DDMI to develop a new set of action levels that are not based on MDMER limits and better reflect approved closure objectives SW1 and SW2.***

Parties also commented on where action levels should apply. In the Mishandled Rock Report, DDMI stated that the proposed action levels will apply to all active water bodies within the Drainage Control and Collection system. As discussed in Section 3.1.2, runoff or seepage from some areas that received mishandled waste rock report directly to the receiving environment and not to the Drainage Control and Collection system. The GNWT-ENR asked DDMI to clarify whether the proposed action levels apply to these areas (GNWT-ENR comment 6). DDMI responded as follows:

DDMI notes the A21 areas which have been identified with the potential to release water outside the water management system contain a highly conservative upper estimate of 4.9% Type III rock (all A-Portal rock assumed to be Type III; see GNWT 3), which was distributed and blended extensively across the laydown due to dozer deposition methods. There is no evidence to suggest this small proportional contribution of A-Portal material would significantly impact potential drainage chemistry outside of what is currently predicted for Type I rock. As ENR notes, A21 areas are not part of the Drainage Control and Collection System which is subject to the proposed Action Levels in Section 9 of the Report. Should new seepage generation be identified at the A21 areas identified in Section 3 of the Report, seepage sampling would commence and the specific situation would be assessed with input from the Inspector and a new SNP station may be activated. Should seepage be consistently identified and a new SNP is activated, DDMI suggests the same Action Levels apply to these stations

In order to sample, analyse and compare monitoring data to action levels, seepage need not come from an established SNP station. The Seepage Survey required by Part H, Condition 15 of the Water Licence is for all detected seeps, and not just those where an SNP station is established. Given that DDMI predicts that there will not be seepage from areas that received mishandled rock, if seepage is in fact detected, it would seem crucial to ensure that a sample is taken, analysed, and compared to action levels. While a certain number of samples may be needed to detect trends in the data (action levels 1 and 2 proposed by DDMI involve trends), this does not mean that action levels should only apply at SNP stations. If a trend cannot be established, then any action level that involves a trend would not be triggered. Further, samples taken from both SNP stations (A21 sump and Pond 7) collect water from other sources and may dilute elevated concentrations from areas that received mishandled rock. For these reasons, the Board agrees

with the GNWT-ENR that the action levels should apply not only to all active water bodies within the Drainage Control and Collection system (as proposed by DDMI) but also to all detected seepage/runoff.

- ***Decision #7: The Board requires DDMI to clarify that action levels apply to all active water bodies within the Drainage Control and Collection system and to all detected seepage/runoff.***

3.3.2 Responses to Action Levels

In the Board's direction to DDMI, the Board gave examples of possible responses, namely: "re-testing to confirm results, re-location of rock, placement of cover material, etc."¹¹ In the Mishandled Rock Report, DDMI proposed that the response to action level 3 would be to "Investigate additional seepage control and/or treatment options." In other words, DDMI did not propose re-location of rock or placement of cover material as a possible response. DDMI was asked to provide a rationale for this (WLWB staff comment 9). In response, DDMI explained that should action level 3 be triggered, the response would include investigating the seepage control option to remove/relocate Type III rock. DDMI suggested updating the description of response level 3 to: "Investigate additional seepage/source control and/or treatment options". The Board agrees with DDMI's solution to revise action level 3, although to remove any ambiguity about what source control means, "(e.g., relocate rock)" should be added to illustrate what is meant by source control.

- ***Decision #8: The Board requires DDMI to revise Response Level 3 to read: "Investigate additional seepage control/source control (e.g., relocate waste rock) and/or treatment options".***

DDMI's proposed action levels do not include implementing mitigations; response Level 3 is to investigate mitigations but not to implement them. The GNWT-ENR commented that "DDMI's Response Level 1 through 3 provide a description of investigations that will be carried out, which are somewhat duplicative of the Action Levels. These Responses do not appear to address the intent of the Board's directive. Additional detail should be provided" (GNWT-ENR comment 9). ENR recommended that DDMI provide contingencies if action levels are exceeded. DDMI responded that:

Should an Action Level 3 be triggered, DDMI suggests the results of the Response Level 3 be provided to the WLWB for Review. Depending on the investigation results a specific follow up action may be proposed. At this time, and particularly without site closure criteria, it is DDMI's opinion that it is too early to commit to detailed actions such as re-location of rock or placement of cover materials.

The Board agrees with DDMI that there is a risk of implementing costly and unwarranted response actions when closure criteria are not better developed, and that DDMI's proposed solution (to provide the results of investigations with any proposed mitigations to the Board for review) is worth further discussion. The Board also suggests that DDMI could report the results of investigations in the subsequent Seepage Survey

¹¹ See WLWB Online Registry for [Diavik - Waste Rock Misclassification - Board Directive - Oct 24 17](#).

Report. Parties have not had an opportunity to comment on DDMI's approach, which could assist in refining it.

- ***Decision #9: The Board requires DDMI to add to Response Level 3 that "Should an action level 3 be triggered, the results of the investigations and any proposed mitigations will be submitted to the Board for review in the subsequent Seepage Survey Report."***

3.3.3 Which Water Licence Submission Should House the Action Levels and Responses?

The Water Licence and Schedules do not currently have requirements for DDMI to define action levels and responses related to mishandled rock. In its cover letter to the Mishandled Rock Report, DDMI proposed that action levels could be added to the Water Management Plan, when next updated. The GNWT-ENR recommended that the Board's direction for DDMI to develop acceptable action levels for Monitoring seepage "continue to be part of the review of Seepage Survey licence requirements (i.e., in a review process and document that is approved by the Board)" (GNWT-ENR comment 8). DDMI agreed with the GNWT-ENR stating that DDMI "supports formal inclusion of action levels for seepage monitoring within the requirements of Part H Item 16 and requests that the WLWB revise Schedule 6 Item 6 to include these specific requirements." In other words, DDMI agreed that the action level and responses should be in the Seepage Survey Report, which is for Board approval.

The Board is of the view that action levels and responses may be more appropriate in a management plan rather than an annual report. Although reporting of these exceedances could take place via the annual Seepage Survey Report (see Section 3.4), the establishment of the action levels would be more appropriate in a management plan. This would be consistent with other WLWB-issued water licences (e.g., the Fortune Minerals Water Licence) that require action levels and response actions in each management plan and require the Licensee to report exceedances of action levels and responses taken in annual reports. In the Board's view, the water management plan (as proposed in DDMI's cover letter) is not ideal for these action levels, since the water management plan addresses water from many sources aside from waste rock seepage, and there are no other action levels for those sources. The action levels in question are specific to waste rock and concerns related to its geochemistry and are therefore most appropriate in the waste rock management plan.

- ***Decision #10: The Board requires DDMI to include the action levels and responses (including the revisions in Decisions #7 to #10) in the Waste Rock Management Plan.***

To address this new requirement for the WRMP, the Board is of the view that the Schedule for the WRMP should be updated accordingly (i.e., Schedule 6, Condition 5).

- ***Decision #11: The Board requires DDMI to propose wording for Schedule 6, Condition 5 to require action levels and responses when it submits the next Version of the Waste Rock Management Plan.***

To develop this wording, DDMI should consider the requirements for action levels and responses in the Fortune Minerals Water Licence (W2008L2-0004), for example in Schedule 6, Condition 3 for the Geochemical Characterization and Management Plan.

3.4 Reporting

The Board directed DDMI to provide a description of how DDMI will report monitoring results, any exceedances of action levels, and a description of actions to be taken in response to any exceedances.¹² In the Mishandled Rock Report, DDMI proposed that the results, as well as any exceedances or actions taken in response to possible exceedances, will be reported in the annual Seepage Survey report. DDMI reiterated this commitment in response to GNWT-ENR comment 4 which recommended that seepage results be reported in a dedicated section of future Seepage Survey Reports (GNWT-ENR comment 4). The Board acknowledges DDMI's commitment and requires DDMI to include a dedicated section in future Seepage Survey Reports summarizing the presence or absence of seepage from the areas constructed with mishandled rock.

- ***Decision #12: The Board requires DDMI to include results of monitoring of each of the 10 areas referred to in Decision #3 and any action level exceedances and responses taken in a dedicated section in the annual Seepage Survey Report.***

3.5 Other Requirements from the October 24, 2017 Board Direction

The Board required that DDMI provide a more detailed description of the revisions DDMI made to its Standard Operating Procedures (SOPs) and DDMI's views on whether the SOPs should be appended to the Waste Rock Management Plan. DDMI responded that all underground waste rock has been classified conservatively as Type III and that information has been updated in the SOP. DDMI stated in the response that, "SOPs should not be included in Management Plans as they are internal documents that may be frequently updated to adapt to changing operational conditions" and that the SOPs are available to the Inspector upon request. The Board is of the view that DDMI's responses is satisfactory.

The Board also required that DDMI provide a cost estimate of the preferred response actions that would be taken. DDMI responded that, as no further response actions are necessary, a cost estimate is not required. Given the approach for Response Level 3 discussed above (DDMI's preferred response would be submitted to the Board following the company's investigations), the evidence provided by DDMI to support their assertion that the risk of contaminated seepage from mishandled rock is low, and the fact that no Parties raised this issue, the Board agrees that a cost estimate is not warranted at this time. The Board could reconsider this issue in the future, for example, based on monitoring data or its review of the interim Closure and Reclamation Plan and associated security estimate.

¹² See WLWB Online Registry for [Diavik - Waste Rock Misclassification - Board Directive - Oct 24 17](#).

Signed the 6th Day of May 2019, on behalf of the Wek'èezhii Land and Water Board



Witness



Joe Mackenzie
Chair, Wek'èezhii Land and Water Board

Attachment

1. List of required revisions

Attachment #1. Required Revisions Related to Mishandling Report

Interim Closure and Reclamation Plan Version 4.1	
1	Include a map/figure showing areas where A-Portal rock has been placed in roads and laydown pads.
2	Identify that the PKC barge road contains Type III rock and provide DDMI's rationale for why the Type III rock will be left in the PKC Barge Road
Waste Rock Management Plan	
3	Include a map that shows all 10 areas that received mishandled rock, drainage directions, and SNP stations.
4	Revise the appropriate sections of the Waste Rock Management Plan to state that DDMI will conduct a Seepage Survey of all constructed areas, including each of the 10 areas referred to in Decision #3
5	Include the following sentence in the appropriate section of the Waste Rock Management Plan: "Should new seepage generation be identified at the A21 laydown, A21 light vehicle roads, A21 haul roads, A21 light vehicle access road, or the Pond 3 pipe bench, seepage sampling would commence, and, if seepage is consistently detected, DDMI will propose an additional SNP station for the Board's consideration."
6	Develop a new set of action levels that are not based on MDMER limits and better reflect approved closure objectives SW1 and SW2.
7	Clarify that action levels apply to all active water bodies within the Drainage Control and Collection system and to all detected seepage/runoff.
8	Revise Response Level 3 to read: "Investigate additional seepage control/source control (e.g., relocate waste rock) and/or treatment options".
9	Add to Response Level 3 that "Should an action level 3 be triggered, the results of the investigations and any proposed mitigations will be submitted to the Board for review in the subsequent Seepage Survey Report."
10	Add action levels and responses related to mishandled waste rock (including the revisions in Decisions #7 to #10) in the Waste Rock Management Plan.
11	Propose wording for Schedule 6, Condition 5 to require action levels and responses when it submits the next Version of the Waste Rock Management Plan. This could be achieved in the cover letter to the WRMP.
Seepage Survey Report	
12	Include results of monitoring of each of the 10 areas referred to in Decision #3 and any action level exceedances and responses taken in a dedicated section in the annual Seepage Survey Report.