Review Comment Table

Board:	WLWB
Review Item:	Diavik - Waste Rock Misclassification - Investigation Summary Report (W2015L2-0001)
File(s):	W2015L2-0001
Proponent:	Diavik Diamond Mines (2012) Inc.
Document(s):	Waste Rock Misclassification Investigation Summary Report (5864 KB)
Item For Review Distributed On:	Oct 25 at 08:45 Distribution List
Reviewer Comments Due By:	Jan 30, 2019
Proponent Responses Due By:	Feb 13, 2019
Item Description:	Diavik Diamond Mine (2012) Inc. (DDMI) submitted the Diavik A-Portal Waste Rock Misclassification Investigation Summary Report (the Report) on October 4, 2018. The Report presents the outcomes and actions taken to address the A-Portal waste rock mishandling incident, first reported to the Department of Lands – Government of Northwest Territories (GNWT) Inspector on May 4th, 2017. On July 3, 2017, DDMI submitted a Waste Rock Misclassification Report to the Inspector and copied the Wek'eezhii Land and Water Board (WLWB or the Board). 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's October 24, 2017 Directive required that DDMI submit information largely as it relates to DDMI's action plan with a focus on how the mishandling of rock impacts Water Licence submissions. As with DDMI's July 3, 2017 Waste Rock Misclassification Report, the Board will review this submission based on the implications of waste rock mishandling to Water Licence requirements such as closure and monitoring, rather than from a compliance perspective.

	Reviewers are invited to submit comments and recommendations using the Online Review System (ORS) by the review comment deadline specified below. If reviewers seek clarification on the submission, they are encouraged to correspond directly with the proponent prior to submitting comments and recommendations. All documents that have been uploaded to this review are also available on our public registry. If you have any questions or comments about the ORS or this review, please contact Board staff identified below. **February 5, 2019:** ***The proponent responses deadline has been extended from February 8 to February 13, 2019, in response to a request by DDMI.***
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Comment Summary

Diavik Diamond Mines (2012) Inc. (Proponent)			
ID	**Topic**	**Reviewer Comment/Recommendation**	**Proponent Response**
1	General File	**Comment** (doc) Cover Letter - DDMI Response to Reviewer Comments and Recommendations re: Diavik A-Portal Waste Rock Mishandling Investigation Summary Report **Recommendation**	
GNWT - ENR: Central Email GNWT			
ID	**Topic**	**Reviewer Comment/Recommendation**	**Proponent Response**

12	General File	**Comment** (doc) ENR Letter with Comments and Recommendations with Attached Memorandum **Recommendation**	
13	General File	**Comment** (doc) Attachment: Brodie Consulting Ltd. January 28, 2019 Memorandum - Review of Diavik A- Portal Waste Rock Mishandling Investigation Summary **Recommendation**	
1	Topic 1: Brodie Consulting Ltd. Memorandum	**Comment** ENR retained Brodie Consulting Ltd. (BCL) to conduct a review of DDMI's Waste Rock Misclassification - Investigation Summary Report. ENR has extracted and summarized the comments and recommendations from the memorandum from BCL and provided them below. ENR has also included the memorandum which provides additional background for the Board's information. **Recommendation** 1) ENR recommends the Board refer to the attached memorandum for additional background and context supporting ENRÃ¢Â€Â™s comments and recommendations.	**Feb 13:** N/A
2	Topic 2: Implications for Closure Planning	**Comment** At this time there are no plans to consolidate or cover roads and laydowns. However, it is noted that following review of DDMI's Closure and Reclamation Plan Version 4.0 the Board presented a discussion on WRSA Issue #2: Closure Plan for A154/418 Type I Rock (WLWB December 17, 2018). Revision #3 requires additional information related to Type I rock used in construction (laydown pads, roads, etc.). It is recommended that the inadvertent use of Type III waste rock in surface construction be considered in the context of the Board's requirement to assess risk posed by poor quality seepage/runoff from A154/A418 Type I rock and closure options. If in the future it is determined that additional closure measures are required, DDMI's documentation of	**Feb 13:** DDMI agrees that this documentation may be useful in the future if it is determined that additional closure measures are required. DDMI would like to emphasize that the total proportion of mishandled A-Portal Type III rock that was incorporated into surface construction amounts to approximately 0.03% of the Waste Rock on site. While ENR's suggestion to prioritize any additional closure measures to these areas is logical, it is highly unlikely that the application of additional closure measures to these areas alone would materially change any risk posed by poor quality seepage/runoff from A154/A418 Type I rock used in site construction.

		where Type III has been used for surface construction will be useful in determining areas of priority. **Recommendation** 1) ENR recommends that the mishandling of A-Portal waste rock be maintained as a consideration in the ongoing evaluation of risk and closure options for A154/A418 waste rock.	
3	Topic 3: Overall Investigation	**Comment** Section 5 Summary of Surface Construction Investigation suggests that as a result of the way in which Type III waste rock was distributed and placed, it ultimately resulted in bulk geochemical characteristics within the classification range for Type I rock according to the Waste Rock and Ore Management Plan (DDMI, 2018). ENR understands that the classification criteria used by Diavik to be on a spectrum of sulphide content and that even Type I waste rock may have small quantities of biotite schist. However, ENR is concerned with the conclusion of this section that the blended Type I/Type III areas are equivalent to Type I only areas. Areas identified as having been constructed of a mixture of Type I and Type III waste rock should be classified and documented as such. All areas where Type III material was inadvertently placed should continue to be monitored for signs of poor quality seepage or runoff. DDMI has stated, and ENR acknowledges, that the Water Licence currently requires seepage surveys in areas constructed using waste rock. DDMI further states that this requirement sufficiently addresses the areas where misclassified Type III rock was placed. Given the unique nature of the current scenario, ENR believes that additional scrutiny should be placed on areas where misclassified Type III rock was placed. **Recommendation** 1) ENR recommends that areas constructed as a mixture of Type I and Type III rock	**Feb 13:** As ENR notes, DDMI waste rock is classified as Type I or Type III based on the bulk sulfur content. To ensure this investigation was conservatively predictive of the potential impact of mishandled waste rock from the A-Portal, all A-Portal rock was assumed to have a sulfur content of 0.134 wt%S (average value for Type III rock) despite geospatial analysis suggesting a bulk A-Portal sulfur content of 0.051 wt%S (or a low end Type II rock). Areas identified in this report as having been constructed of a mixture of Type I and A-Portal waste rock are not accurately described as being constructed with a mixture of Type I and Type III (this was only a conservative assumption). The purpose of this investigation was to quantify and action the actual presence of Type III rock in the constructed areas and the investigation did not identify any such locations. As ENR acknowledges, the Water License currently requires seepage surveys in areas constructed using waste rock and DDMI is committed to diligently continueing this work with added scrutiny in the areas identified in Section 3 of the Report. DDMI would like to reiterate that to date seepage has not been observed flowing out from the laydowns or roadways in the affected areas. A likely explanation for the lack of seepage observed from site laydowns and roads is provided in Section 6 of the Report. DDMI will also continue to document the presence of potential Type III rock in Section 2.5 and Table 6 of the Waste Rock

		should continue to be classified and documented as such.	Management Plan; however, DDMI notes that this investigation concluded that these areas were constructed with rock having a bulk sulfur content of 0.01 wt%S which equates to Type I rock.
4	None	**Comment** None **Recommendation** 2) ENR recommends that the seepage survey results (e.g. presence/absence of seepage and results of any analysis), in areas where misclassified Type III material was placed, be summarized and reported in a dedicated section of future Seepage Survey Reports.	**Feb 13:** DDMI will include a section in future Seepage Survey Reports summarizing the presence/absence of seepage from areas identified in Section 3 of the Report and the results of any analysis.
5	Topic 4: Adequacy of Current SNP Network	**Comment** Section 6 states that "an assessment of the site watersheds and water collection system (Appendix D) confirmed that potential drainage from both areas at A21 is expected to terminate in the A21 Open Pit and potential drainage from the Pond 3 pipe bench is expected to terminate in Pond 7. Therefore, seepage or runoff from the flagged locations will be monitored at currently active SNP stations." ENR is concerned that the SNP station at the A21 pit, 1645-51, appears to be a sump in the A21 pit. ENR expects that this location will receive water from a number of sources, and that any contributions from the A21 areas where misclassified Type III rock was placed will be difficult to identify. The current SNP station is sufficient to identify and track overall water quality from the A21 area, but will likely not be able to identify localized areas of poor quality drainage. During operations any poor quality seepage from the affected A21 areas will be collected and managed, however localized areas of poor quality seepage may become a concern post-closure. ENR is not recommending that a new SNP station be established at this time, given the current lack of observed seepage at the affected A21 locations. However, if seepage locations	**Feb 13:** Infrastructure surveys by DDMI staff are used to detect if seepage is draining through or escaping structures. This may occur in new areas, or in those which are currently, or were previously, monitored by SNP stations. 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.

		develop in this area in the future, then a dedicated SNP station should be established. **Recommendation** 1) ENR recommends that seepage generation at affected A21 areas be monitored. A dedicated SNP monitoring point should be established if seepage is consistently identified in this area.	
6	Topic 5: Action Level Applicability to Monitored Areas	**Comment** In response to the Board's Directive, Action levels related to monitoring data, DDMI has proposed Action Levels to be evaluated in the Annual Seepage Survey Report that apply to all active water bodies within the Drainage Control and Collection (DCC) system. ENR notes A21 areas are not shown as part of the Drainage Control and Collection System Capture in Appendix D. Furthermore, Section 1 Summary of A-Portal Waste Rock Mishandling states that "portions of the A21 area have the potential to release runoff that may not be collected in the water management system". Therefore, it isn't clear how any of the proposed Action Levels would be triggered by poor quality seepage/runoff from these A21 areas that were constructed with Type III waste rock. **Recommendation** 1) ENR recommends that DDMI clarify whether these Action Levels apply to any seepage from areas where Type III waste rock has been mishandled including the A21 areas that according to Appendix D, are not shown to report to the Drainage Control and Collection System.	**Feb 13:** 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.
7	Topic 6: Action Levels Related to Monitoring Data	**Comment** As written, it appears that DDMI has proposed that Action Level 1 will be triggered in the event a seep is predicted to result in exceedances of MDMER guidelines within a water body within the DCC within three years and be shown to be statistically significant. ENR is concerned that this level is too high to address	**Feb 13:** 1) 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

		mishandled waste rock. Seepage will persist into closure, and action level trigger concentrations should align with criteria developed through the closure planning process. ENR acknowledges that approved water quality closure criteria are not available for DDMI to compare seepage quality against. In the interim, comparison against existing effluent discharge limits could be considered as a screening tool. **Recommendation** 1) ENR recommends that MDMER limits are not appropriate action level triggers for seepage quality. Alternative trigger concentrations should be developed.	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. (please see also WLWB 8)
8	None	**Comment** None **Recommendation** 2) ENR recommends that the BoardÃ¢Â€Â™s Directive 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).	**Feb 13:** 2) 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.
9	Topic 7: Description of Response Actions	**Comment** The Board directed DDMI to provide "A description of actions that may be taken if action levels are exceeded (e.g. re-testing to confirm results, re-location of rock, placement of cover material, etc.)". 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. **Recommendation** 1) ENR recommends the BoardÃ¢Â€Â™s Directive continue to be developed with DDMI providing contingencies in the event that the mishandling of Type III waste rock results in exceedance of Action Levels.	**Feb 13:** DDMI Response Level 3 states: "Investigate additional seepage control and/or treatment options." 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. (please see also WLWB 9)

10	Topic 8: Seepage Collection	**Comment** The Board directed DDMI to provide "Confirmation that seepage from the areas that received mishandled rock is collected and cannot be released to the environment". DDMI has stated that "DDMI confirms that seepage from the areas that received A-portal waste rock is not released to the environment". It is not understood how DDMI could make this claim for the A21 construction areas which are not within DDMI's DCC system. It appears that potential runoff from several areas shown in Figure 1 (e.g. Zone 1, Zone 2) would be released to the environment and not flow to the A21 pit. DDMI has however predicted that there will be little to no seepage. **Recommendation** 1) ENR recommends that DDMI provide additional rationale to support the statement: "DDMI confirms that seepage from the areas that received A-portal waste rock is not released to the environment".	**Feb 13:** See ENR 6; specifically, 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. In addition, given the lack of observed flow from these areas, and a lack of historical flow observations from similar laydown or road areas on site, DDMI has no evidence to suggest that seepage from these areas has been or will be released to the environment. In accordance with Part H Item 15 of the License, DDMI shall continue to conduct Seepage surveys for the areas constructed with mined or quarried rock and these survey results will provide ongoing evidence to support or disprove this conclusion.
11	Topic 9: References	**Comment** The following references are provided in support of ENR comments and recommendations: Diavik Diamond Mines (2012) Inc., 2018. Waste Rock Management Plan Version 8. May 3, 2018 Diavik Diamond Mines (2012) Inc., 2017. Report on A-Portal Waste Rock Misclassification. July 3, 2017 Wek'èezhìi Land and Water Board, 2018. Closure and Reclamation Plan Version 4.0. Decision from the Wek'èezhìi Land and Water Board Meeting of December 7, 2018. **Recommendation** None	**Feb 13:** N/A
WLWB: Anita Ogaa			
ID	**Topic**	**Reviewer Comment/Recommendation**	**Proponent Response**
1	Section 1 Summary of A-Portal Waste Rock Mishandling	**Comment** Section 1 of the Report states, "The usage of type III rock in the barge road may be acceptable pending demonstration that the material will remain non-oxidized	**Feb 13:** 1) At closure this material will be located in the central core of the PKC Facility and be encapsilated by approximitely 9m to 15m of saturated fine processed

		and within the lined facility following closure." **Recommendation** 1) How does DDMI propose to demonstrate the material will remain non-oxidized? 2) What are the implications if the material is shown not to remain non oxidized?	kimberlite. Based on this information it is highly unlikely the material will oxidize. 2) Should this material oxidize and release metals it is not anticipated to change bulk facility seepage chemistry given it accounts for 0.01% of the total material in the PKC Facility.
2	Section 2.1 Waste Rock Used for Construction	**Comment** Section 2.1 of the Report states, "The final destination logged by the operator does not include specific information such as GPS coordinates or the end use of the material." **Recommendation** Please describe the operational or logistical implications of recording more specific information on the location of materials used in construction.	**Feb 13:** To track more specific information (e.g. GPS coordinates) on the location of all materials used in construction, all equipment at the DDMI site would need to be retrofitted with new hardware and software to automatically track load source and destination information. This would require a significant capital expenditure, an update to operational procedures, relevant training for all technical and operational staff and planning for ongoing maintenance of new hardware and software.
3	Section 2.1.1.3 Main Haul Road	**Comment** DDMI indicates that there were 9 days when acid-generating material was spread in the main haul road, and that this accounted for about 10% of the total volume of material in the road. DDMI did not identify this as one of the three areas of concern and did not take any samples in this area. DDMI concluded that overall, the rock in the main haul road was classified as non-acid generating potential. DDMI did not specifically identify the main haul in the Compliance Summary Table (Table 2). Presumably, the main haul road was lumped in with "additional surface construction areas" in Table 2. For these areas, DDMI indicated that "analysis demonstrates all remaining surface construction projects received A-Portal (potential Type III) waste in a well distributed, or blended proportion of < 5%, therefore demonstrating this rock is Type I." However, the proportion of acid-generating material in the main haul road was 10%. **Recommendation** Please explain why the main haul road	**Feb 13:** Theoretically, a contribution of 25% A-Portal rock to a construction project equates to a conservatively overestimated (emphasis added) bulk sulfur content of 0.04 wt%S. This corresponds to the division between TI and TII rock, or the division between non-acid generating and low potential acid generating rock. The low end of potential acid generation begins at 0.08 wt%S. A 10% contribution of A-Portal rock is therefore expected to remain within the non-acid generating range. Focussed sampling was conducted in areas with a higher acid generating potential, or specifically any area in the range of low to potential acid generation (>0.04 wt%S). The sulfur sampling results from targeted sampling in more highly impacted areas did not show elevated sulfur content, therefore areas that were less impacted (e.g. Main Haul Road) were expected to have a comparably lower sulfur content.

		was not identified as an area of concern and no samples were taken from this area.	
4	Section 3 Sample size	**Comment** DDMI sampled rock in three areas deemed to have "the potential to contain zones of bulk waste rock with a low acid generating potential." **Recommendation** Please describe in as much details as possible (e.g., statistical analysis) how the number of samples taken in each area sufficiently represents the volumes of A-Portal rock used in each of these areas.	**Feb 13:** Twenty-four 6.5" diameter drill holes were distributed evenly across the three (3) impacted areas and drilled through the full thickness of construction material. This included ten locations in Zone 1A, six (6) locations on the A21 North Haul Road, and eight (8) locations on the Pond 7 Pipe Bench. During construction, material was deposited and spread into a flat surface with a D10 dozer in each area. Based on this depostion pattern, any potential zones of elevated sulfur were expected to be spread such that intersection by the sampling plan design was likely. Based on the results of the sampling program, DDMI intended to identfy the need for additional sulfur sampling. Of the 24 sample locations, eleven had sulfur results below the method detection limit (<0.01 wt%S), twelve had sulfur results equal to the method detection limit (0.01 wt%S), and one sample had a result half of the upper limit of Type I rock (0.02 wt%S; TI upper limit of 0.04 wt%S). This sampling program demonstrated that 100% of twenty-four sample locations had a sulfur content on the low end of Type I rock, and therefore additional sampling was not recommended. Had this program identified locations with an elevated sulfur content, an additional targetted sampling program would have been developed.
5	Figure 1, Appendix D Flow direction and SNP locations	**Comment** The Board required DDMI to provide maps indicating direction of potential water flows from the areas containing the mishandled rock. Figure 1 shows the areas in question, and the "Watersheds and Collection Ponds" figure in Appendix D depicts SNP locations and flow directions for the site. There are no arrows on that	**Feb 13:** DDMI would like to reiterate that to date, seepage has not been observed flowing out from the laydowns or roadways in the affected areas. A likely explanation for the lack of seepage observed from site laydowns and roads is provided in Section 6 of the Report. Details on the predicted direction of water flow

		figure indicating flow direction from the areas in question. Also, the areas that received A-Portal waste are shaded light green in the Watersheds and Collection Ponds Figure. The green shading in the legend is indicated as "Potential Discharge to Receiving Area", although it is a slightly darker green. Later in the document, DDMI states that "Seepage from the areas that received A-portal waste rock is not released to the environment." **Recommendation** Please describe the direction water flows from each of the ten areas that received A-Portal rock and identify where seepage from each area reports.	from the ten areas is as follows: 1) A21 Main Roadway Berm: unobserved potential flow into A21 Pit. 2) A21 Light Vehicle Road: unobserved potential flow into A21 Pit. 3) A21 Main Haul Road: unobserved potential flow into A21 Pit. 4) A21 North Haul Road: unobserved potential flow into A21 Pit. 5) A21 Light Vehicle Access Road: unobserved potential flow into tundra / LDG to the South East. 6) Pond 3 Pipebench: unobserved potential flow into Pond 7 (Drainage Control and Collection System) 7) A21 Marine Laydown: unobserved potential flow into A21 Pit. 8) A21 Zone 1A Laydown: unobserved potential flow into A21 Pit. 9) A21 Zone 1 Laydown: unobserved potential flow into tundra / LDG to the South West. 10) A21 Zone 2 Laydown: unobserved potential flow into tundra / LDG to the South West.
6	Section 9 Monitoring	**Comment** The Board required DDMI to describe a more "robust monitoring effort to detect elevated metals or acidity in seepage/runoff from all areas that received mishandled waste rock (including the WRSA and on-site infrastructure) in order to determine whether a response action is necessary". The Board also required DDMI to provide a "map of current and newly proposed monitoring locations and an explanation of how the locations will ensure detection of elevated metals or acidity in seepage/runoff from all areas that may have received mishandled waste rock." DDMI responded that "The current SNP and seepage surveys are sufficient to monitor areas that received A-Portal waste rock" and provided a rationale in Section 6 of the submission. It is not clear from the map of SNP stations that there are stations that collect seepage from all ten areas that received mishandled rock. Further, it appears that the SNP stations in the vicinity of the mishandled rock collect	**Feb 13:** Potential water flow from Areas 1-4, and 7-8 is captured and monitored by the A21 Sump SNP Station 1645-51. The A21 Sump collects dewatering water from the A21 Pit and any surface runoff from the Pit watershed identified in Appendix D of the Report. Given there has been no observed flow from these impacted areas, or similar surface infrastructure, it is unlikely to be detected in the SNP Station chemistry. Potential water flow from Area 5 is not captured by an SNP Station. Should flow be observed during routine infrastructure surveys, seepage sampling would commence and the specific situation would be assessed with input from the Inspector and a new SNP station may be activated. Potential water flow from Area 6 is captured and monitored by the Pond 7 SNP Station 1645-44. Pond 7 collects surface runoff from the watershed identified in Appendix D of the Report. Given there has been no observed flow from this

		water from multiple sources, and it is therefore not clear how DDMI can evaluate the seepage quality from the areas in question. **Recommendation** For each of the ten areas that received A-Portal waste: a) identify the SNP station that collects seepage from that area; b) identify other sources of water that report to that SNP station; and c) explain how each monitoring location will ensure detection of elevated metals or acidity from mishandled rock. This information could be provided in a table or narrative form.	impacted area, or similar surface infrastructure, it is unlikely to be detected in the SNP Station chemistry. Potential water flow from Areas 9-10 is not captured by an SNP Station. Should flow be observed during routine infrastructure surveys, seepage sampling would commence and the specific situation would be assessed with input from the Inspector and a new SNP station may be activated.
7	Section 9 Monitoring	**Comment** DDMI indicated that seepage from areas that received mishandled rock will be collected during the seepage survey, if detected. **Recommendation** 1. How will DDMI ensure during the seepage survey that locations that received mishandled rock are checked for seepage? 2. Discuss the feasibility of developing new SNP stations for some or all areas that received mishandled waste rock.	**Feb 13:** 1) Should flow be observed during routine infrastructure surveys, seepage sampling would commence and the specific situation would be assessed with input from the Inspector and a new SNP station may be activated. 2) Given the lack of currently observed flow from these areas, and a lackof historical flow observations from similar areas on site, it is unclear how or where new SNP Stations would be developed. See response to (1).
8	Section 9 Action Levels	**Comment** The Board required DDMI to propose action levels. DDMI's proposed action levels (1 and 3) compare monitoring data to the Metal and Diamond Mining Effluent Regulation (MDMER) monthly average authorized discharge limit for nickel (0.5 mg/L)." The AEMP benchmark for nickel is 0.025 mg/L and the EQC (max) is 0.05 mg/L. **Recommendation** 1. Please explain the rationale for using the MDMER limit for nickel. 2. Discuss the pros/cons of using an action level that is based on the Water Licence EQC and/or the AEMP benchmark.	**Feb 13:** 1) MDMER is a national quality standard specific to mine discharges to the environment that is applicable at a low flow rate. MDMER guidelines apply to a discharge greater than 50 m3/d. 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. 2) The Water License EQC and the AEMP benchmark are not appropriate as action levels because unlike the MDMER they were not developed or intended for this purpose. The Water License EQC was specifically 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 adversley impact aquatic life or drinking water. 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 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 requred 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 acnowledges 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.
9	Section 9 Action Level Exceedances: Proposed responses	**Comment** DDMI proposed that the response to triggering Action Level 3 (the last/highest Action Level) would be to "Investigate additional seepage control and/or treatment options." However, DDMI's selected response to address two areas that received Type III rock (the light vehicle road berm section and the Type I cell in the North WRSA) is to relocate the rock to the Type III area of the WRSA. **Recommendation** Please provide rationale for why relocation of Type III rock was not included as a response to an action level trigger.	**Feb 13:** Response Level 2 (RL2) states: "Investigate waste rock source: detailed up gradient seepage monitoring and sampling of associated DCC water body. Re-evaluate construction records for up gradient construction materials." RL2 includes a re-examination of the potential occurrence of a Type III rock seepage source. Following RL2, should an Action Level 3 (AL3) be triggered, the response "Investigate additional seepage control (emphasis added) and/or treatment options" would include the seepage control option to remove/relocate Type III rock. DDMI suggests the description of RL3 be updated to state: "Investigate additional seepage/source control and/or treatment options". DDMI also notes the presence of Type III rock was not identified at the conclusion of this investigation, thus widespread relocation of unidentified Type III material is not being considered at this time. The rock that was relocated from the light vehicle road berm and the Type I cell in the WRSA-NCRP was material identified to contain A-Portal waste rock, which had a potential to be Type III. The location (inactive work areas) and deposition state (lose berms) made relocation of this material more straightforward than investigating/confirming the geochemical properties. A similar relocation of misclassified rock in other areas (such as A21) was not completed because it would have involved widespread re-mining of active work areas and caused significant interruptions to site operations. Additionally, the misclassified rock that was

			incorporated into the roads and laydowns was mixed and spread out (via dozer) with a much larger proportion of Type I construction material, thus most of the relocated material would be Type I. Also, the relocated berms were easily identified and were largely unmixed occurrences of misclassified A-Portal rock.

January 30, 2019

Joseph Mackenzie
Chair
Wekeezhii Land and Water Board
#1-4905 48th Street
Yellowknife, NT
X1A 3S3

Dear Mr. Mackenzie,

Re: DDMI Diavik
Water Licence – W2015L2-0001
Waste Rock Misclassification - Investigation Summary Report
Request for Comment

The Department of Environment and Natural Resources (ENR), Government of the Northwest Territories has reviewed the report at reference based on its mandated responsibilities under the Environmental Protection Act, the Forest Management Act, the Forest Protection Act, the *Species at Risk (NWT) Act,* the Waters Act and the Wildlife Act and provides the following comments and recommendations for the consideration of the Board.

Topic 1: Brodie Consulting Ltd. Memorandum

Comment(s):

ENR retained Brodie Consulting Ltd. (BCL) to conduct a review of DDMI's Waste Rock Misclassification – Investigation Summary Report. ENR has extracted and summarized the comments and recommendations from the memorandum from BCL and provided them below. ENR has also included the memorandum which provides additional background for the Board's information.

Recommendation(s):

1) ENR recommends the Board refer to the attached memorandum for additional background and context supporting ENR's comments and recommendations.

Topic 2: Implications for Closure Planning

Comment(s):

At this time there are no plans to consolidate or cover roads and laydowns. However, it is noted that following review of DDMI's Closure and Reclamation Plan Version 4.0 the Board presented a discussion on *WRSA Issue #2: Closure Plan for A154/418 Type I Rock* (WLWB December 17, 2018). Revision #3 requires additional information related to Type I rock used in construction (laydown pads, roads, etc.). It is recommended that the inadvertent use of Type III waste rock in surface construction be considered in the context of the Board's requirement to assess risk posed by poor quality seepage/runoff from A154/A418 Type I rock and closure options. If in the future it is determined that additional closure measures are required, DDMI's documentation of where Type III has been used for surface construction will be useful in determining areas of priority.

Recommendation(s):

1) ENR recommends that the mishandling of A-Portal waste rock be maintained as a consideration in the ongoing evaluation of risk and closure options for A154/A418 waste rock.

Topic 3: Overall Investigation

Comment(s):

Section 5 *Summary of Surface Construction Investigation* suggests that as a result of the way in which Type III waste rock was distributed and placed, it ultimately resulted in bulk geochemical characteristics within the classification range for Type I rock according to the Waste Rock and Ore Management Plan (DDMI, 2018).

ENR understands that the classification criteria used by Diavik to be on a spectrum of sulphide content and that even Type I waste rock may have small quantities of biotite schist. However, ENR is concerned with the conclusion of this section that the blended Type I/Type III areas are equivalent to Type I only areas. Areas identified as having been constructed of a mixture of Type I and Type III waste rock should be classified and documented as such.

All areas where Type III material was inadvertently placed should continue to be monitored for signs of poor quality seepage or runoff. DDMI has stated, and ENR acknowledges, that the Water Licence currently requires seepage surveys in areas constructed using waste rock. DDMI further states that this requirement sufficiently addresses the areas where misclassified Type III rock was placed. Given the unique nature of the current scenario, ENR believes that additional scrutiny should be placed on areas where misclassified Type III rock was placed.

Recommendation(s):

1) ENR recommends that areas constructed as a mixture of Type I and Type III rock should continue to be classified and documented as such.

2) ENR recommends that the seepage survey results (e.g. presence/absence of seepage and results of any analysis), in areas where misclassified Type III material was placed, be summarized and reported in a dedicated section of future Seepage Survey Reports.

Topic 4: Adequacy of Current SNP Network

Comment(s):

Section 6 states that "an assessment of the site watersheds and water collection system (Appendix D) confirmed that potential drainage from both areas at A21 is expected to terminate in the A21 Open Pit and potential drainage from the Pond 3 pipe bench is expected to terminate in Pond 7. Therefore, seepage or runoff from the flagged locations will be monitored at currently active SNP stations."

ENR is concerned that the SNP station at the A21 pit, 1645-51, appears to be a sump in the A21 pit. ENR expects that this location will receive water from a number of sources, and that any contributions from the A21 areas where misclassified Type III rock was placed will be difficult to identify. The current SNP station is sufficient to identify and track overall water quality from the A21 area, but will likely not be able to identify localized areas of poor quality drainage. During operations any poor quality seepage from the affected A21 areas will be collected and managed, however localized areas of poor quality seepage may become a concern post-closure.

ENR is not recommending that a new SNP station be established at this time, given the current lack of observed seepage at the affected A21 locations. However, if seepage locations develop in this area in the future, then a dedicated SNP station should be established.

Recommendation(s):

1) ENR recommends that seepage generation at affected A21 areas be monitored. A dedicated SNP monitoring point should be established if seepage is consistently identified in this area.

Topic 5: Action Level Applicability to Monitored Areas

Comment(s):

In response to the Board's Directive, *Action levels related to monitoring data,* DDMI has proposed Action Levels to be evaluated in the Annual Seepage Survey Report that apply to all active water bodies within the Drainage Control and Collection (DCC) system. ENR notes A21 areas are not shown as part of the Drainage Control and Collection System Capture in Appendix D. Furthermore, Section 1 *Summary of A-Portal Waste Rock Mishandling* states that "portions of the A21 area have the potential to release runoff that may not be collected in the water management system". Therefore, it isn't clear how any of the proposed Action Levels would be triggered by poor quality seepage/runoff from these A21 areas that were constructed with Type III waste rock.

Recommendation(s):

1) ENR recommends that DDMI clarify whether these Action Levels apply to any seepage from areas where Type III waste rock has been mishandled including the A21 areas that according to Appendix D, are not shown to report to the Drainage Control and Collection System.

Topic 6: Action Levels Related to Monitoring Data

Comment(s):

As written, it appears that DDMI has proposed that Action Level 1 will be triggered in the event a seep is predicted to result in exceedances of MDMER guidelines within a water body within the DCC within three years and be shown to be statistically significant. ENR is concerned that this level is too high to address mishandled waste rock.

Seepage will persist into closure, and action level trigger concentrations should align with criteria developed through the closure planning process. ENR acknowledges that approved water quality closure criteria are not available for DDMI to compare seepage quality against. In the interim, comparison against existing effluent discharge limits could be considered as a screening tool.

Recommendation(s):

1) ENR recommends that MDMER limits are not appropriate action level triggers for seepage quality. Alternative trigger concentrations should be developed.

2) ENR recommends that the Board's Directive 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).

Topic 7: Description of Response Actions

Comment(s):

The Board directed DDMI to provide "A description of actions that may be taken if action levels are exceeded (e.g. re-testing to confirm results, re-location of rock, placement of cover material, etc.)".

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.

Recommendation(s):

1) ENR recommends the Board's Directive continue to be developed with DDMI providing contingencies in the event that the mishandling of Type III waste rock results in exceedance of Action Levels.

Topic 8: Seepage Collection

Comment(s):

The Board directed DDMI to provide "Confirmation that seepage from the areas that received mishandled rock is collected and cannot be released to the environment". DDMI has stated that "DDMI confirms that seepage from the areas that received A-portal waste rock is not released to the environment". It is not understood how DDMI could make this claim for the A21 construction areas which are not within DDMI's DCC system. It appears that potential runoff from several areas shown in Figure 1 (e.g. Zone 1, Zone 2) would be released to the environment and not flow to the A21 pit. DDMI has however predicted that there will be little to no seepage.

Recommendation(s):

1) ENR recommends that DDMI provide additional rationale to support the statement: "*DDMI confirms that seepage from the areas that received A-portal waste rock is not released to the environment*".

Topic 9: References

Comment(s):

The following references are provided in support of ENR comments and recommendations:

Diavik Diamond Mines (2012) Inc., 2018. Waste Rock Management Plan Version 8. May 3, 2018

Diavik Diamond Mines (2012) Inc., 2017. Report on A-Portal Waste Rock Misclassification. July 3, 2017

Wek'èezhìi Land and Water Board, 2018. Closure and Reclamation Plan Version 4.0. Decision from the Wek'èezhìi Land and Water Board Meeting of December 7, 2018.

Recommendation(s):

None

Comments and recommendations were provided by ENR technical experts in the Water Management and Monitoring Division and the North Slave Region and were coordinated and collated by the Environmental Assessment and Monitoring Section (EAM), Environmental Stewardship and Climate Change Division.

Should you have any questions or concerns, please do not hesitate to contact Patrick Clancy, Environmental Regulatory Analyst at (867) 767-9233 Ext: 53096 or email patrick_clancy@gov.nt.ca.

Sincerely,

Patrick Clancy
Environmental Regulatory Analyst
Environmental Assessment and Monitoring Section
Environmental Stewardship and Climate Change Division
Department of Environment and Natural Resources
Government of the Northwest Territories

Att: Brodie Consulting Ltd. January 28, 2019 Memorandum - Review of Diavik A-Portal Waste Rock Mishandling Investigation Summary

BRODIE CONSULTING

MEMORANDUM

DATE: January 28, 2019

TO: Laura Malone; GNWT – ENR

FROM: Lara Fletcher, P.Eng.

SUBJECT: Review of Diavik A-Portal Waste Rock Mishandling Investigation Summary

1 INTRODUCTION

As requested by GNWT – ENR Water Resources Division, Brodie Consulting Ltd. (BCL) has reviewed Diavik Diamond Mines (2012) Inc. report *A Portal Waste Rock Mishandling Investigation Summary* dated October 4, 2018. BCL also provided comments based on review of DDMI's *Report on A-Portal Waste Rock Misclassification* (DDMI, 2017; BCL, 2017).

1.1 Background

According to the report, from about January 1, 2014 to October 2016, all waste rock originating from the A418 underground operations placed at the A-Portal temporary storage area was classified as Type III by underground operations. However, surface operations treated all A-Portal waste rock as Type I and thus placed it in areas not approved for Type III waste rock.

Based on the results of the initial investigation, it was reported that a total of 62,600 tonnes of Type III waste rock was used in surface construction, and a total of 46,700 tonnes of Type III waste rock was stored in the Waste Rock Storage Area - North Country Rock Pile (WRSA-NCRP).

In as much as DDMI's records allow, DDMI has documented the locations that Type III materials may have been used for surface construction. Emphasis was placed on analyzing the A21 laydown and road areas because the majority of A-Portal rock used for surface construction was delivered for A21 surface construction, and portions of the A21 area have the potential to release runoff that may not be collected in the water management system. Although DDMI indicates that based on topography, most of the runoff from A21 roads and laydowns will flow to A21 pit.

Summary of DDMI's Findings

- Type III waste rock accounts for 37% of the 169,699 tonnes of A-Portal Waste Rock used for surface construction between January 2014 and October 2016.
- Overall, this accounts for 3.8% of waste rock used for surface construction during this time.

It is DDMI's opinion that due to small quantity of A-Portal waste rock placed in areas outside of the designated Type III areas, as well as the dilution that would have occurred by way of using

both material from the A-Portal and re-mined Type I during construction, the bulk sulphur content is lower than the upper limit of the classification for non-acid generating rock. Further, DDMI is of the opinion that "*with the exception of one area, waste rock from the A-Portal can remain in the areas in which it was deposited without causing harm to the environment*."

2 COMMENTS AND RECOMMENDATIONS

BCL generally agrees that the quantities of Type III waste rock placed in areas not designated as Type III are relatively small, and that a considerable degree of dilution would have inadvertently resulted from mining a mix of Type I to Type III from A154, stockpiling waste rock at portals, A-Portal waste rock only making up <8% of construction materials in any given month, and the methods of construction, i.e. dozing dumped rock into lifts.

Given the small quantities, the dilution of Type III waste rock, and that Type I waste rock also contributes to loading, the additional loading resulting from the mishandling of the quantities of A-Portal Type III waste rock reported by DDMI is not expected to result in significantly increased impacts. Diavik has committed to monitoring as part of seepage surveys, and existing SNP locations.

2.1 Closure Plan for A154/418 Type I Rock

At this time there are no plans to consolidate or cover roads and laydowns. However, it is noted that following review of DDMI's Closure and Reclamation Plan Version 4.0 the Board presented a discussion on *WRSA Issue #2: Closure Plan for A154/418 Type I Rock* (WLWB RFD December 17, 2018). Revision #3 requires additional information related to Type I rock used in construction (laydown pads, roads, etc.). It is recommended that the inadvertent use of Type III waste rock in surface construction be considered in the context of the Boards requirement to assess risk posed by poor quality seepage/runoff from A154/A418 Type I rock and closure options. If in the future it is determined that additional closure measures are required, Diavik's documentation of where Type III has been used for surface construction will be useful in determining areas of priority.

Recommendation:
It is recommended that the mishandling of A-Portal waste rock be maintained as a consideration in the ongoing evaluation of risk and closure options for A154/A418 waste rock.

2.2 Type III Waste Rock Classified as Type I

Section 5 *Summary of Surface Construction Investigation* suggests that as a result of the way in which Type III waste rock was distributed and placed, it ultimately resulted in bulk geochemical characteristics similar to that which would be classified as Type I rock according to the Waste Rock and Ore Management Plan (DDMI, 2018a).

BCL understands that the classification criteria used by Diavik to be on a spectrum of sulphide content and that even Type I waste rock may have small quantities of biotite schist. However, BCL does not agree that the fact that Type III waste rock was used for surface construction where it was not approved should be misconstrued by suggesting it has all become Type I.

Recommendation:
None.

2.3 Compliance with WLWB October 24, 2017 Directive

This section provides comment on DDMI's responses to the Wek'èezhìi Land and Water Board (WLWB) Directives from October 24, 2017 which DDMI have provided in Section 9 of the Investigation Summary Report.

2.3.1 Board Directive - *Action levels related to monitoring data* and Applicability to A21 Areas

DDMI's response to the WLWB Directive - *Action levels related to monitoring data* provides proposed Action Levels as follows:

> *The following action levels will be evaluated in the Annual Seepage Survey report and apply to all active water bodies within the Drainage Control and Collection (DCC) system. DDMI proposed the following action levels that have been developed specifically to response to an effect caused by the improper placement of Type III waste rock on surface.*
>
> ***Action Level 1**: Statistically significant increasing trend in dissolved nickel concentrations, which predicts an exceedance of the Metal and Diamond Mining Effluent Regulation (MDMER) monthly average authorized discharge limit for nickel (0.5 mg/L) within the next three (3) years, without a corresponding increase in dissolved Molybdenum.*
>
> ***Action Level 2:** The increasing trend is confirmed for two (2) or more additional dissolved metals and a cause other than waste rock is not identified.*
>
> ***Action Level 3:** The DCC system water exceeds MDMER monthly average authorized discharge limits for any metals.*

A21 areas are not shown as part of the Drainage Control and Collection System Capture in Appendix D. Furthermore, Section 1 *Summary of A-Portal Waste Rock Mishandling* states that "portions of the A21 area have the potential to release runoff that may not be collected in the water management system". As such, it isn't clear how any of these Action Levels would be triggered by poor quality seepage/runoff from the A21 construction areas.

Recommendation:
It is recommended that DDMI clarify whether these Action Levels apply to any seepage from areas where Type III waste rock has been mishandled or only for active water bodies within the DCC system, in which case they would not be applicable to monitoring drainage from Type III waste rock used in A21 construction areas.

2.3.2 Board Directive - *Action levels related to monitoring data* and Ongoing Discussions Regarding Seepage Survey Water Licence Requirements

The requirement for a seep to be predicted to result in exceedances of MDMER guidelines within a water body within the DCC within three years and be shown to be statistically significant seems to be a high threshold for an Action Level to address mishandled waste rock. However, it is understood from a limited review of the 2017 Annual Seepage Survey Report (DDMI, 2018b) that the requirements for Seepage Surveys is an ongoing topic of discussion. BCL has not reviewed the 2017 Annual Seepage Survey Report in any detail so cannot comment as to how the Action Levels proposed by DDMI compare to any existing or developing Seepage Survey requirements.

Recommendation:
It is recommended that the WLWB Directive for DDMI to develop acceptable Action Levels for monitoring seepage continue to be part of the review of Seepage Survey licence requirements. That is, in a document and review process that is approved by the Board as opposed to review of the A Portal Waste Rock Mishandling Investigation Summary.

2.3.3 Board Directive - *Description of Actions*

The Board directed DDMI to provide "A description of actions that may be taken if action levels are exceeded (e.g. re-testing to confirm results, re-location of rock, placement of cover material, etc.)".

DDMI's Response Levels 1 through 3 provide a description of investigations that will be carried out, which are somewhat duplicative of the Action Levels described above. These Responses do not appear to address the intent of the Board's directive.

Recommendation:
It is recommended that this Directive continue to be developed with DDMI providing contingencies in the event that the mishandling of Type III waste rock results in exceedance of Action Levels. This could also be done through the Closure and Reclamation Plan review process, as suggested in Comment 2.1, and which is consistent with Revision #51 of the WLWB RFD (WLWB December 17, 2018) which states:

> *Revision #51: For each reclamation activity, identify the preferred contingency and significantly increase the level of detail for this contingency. Ensure all uncertainties associated with the preferred contingency are addressed.*

2.3.4 Board Directive - *Seepage Collection*

The Board directed DDMI to provide "Confirmation that seepage from the areas that received mishandled rock is collected and cannot be released to the environment." DDMI has stated that "*DDMI confirms that seepage from the areas that received A-portal waste rock is not released to the environment*". As discussed in Comment 2.3.1, it is not understood how DDMI can make this claim for the A21 construction areas which are not within DDMI's DCC system. It appears that potential runoff from several areas shown in Figure 1 (e.g. Zone 1, Zone 2) would be released to the environment and not flow to A21 pit. DDMI has however predicted that there will be little to no seepage.

Recommendation:
It is recommended that DDMI better address the Board directive.

References:

Brodie Consulting Ltd, 2017. Review of Diavik Waste Rock Misclassification Report. Memo prepared for GNWT-ENR. August 28, 2017

Diavik Diamond Mines (2012) Inc., 2018a. Waste Rock Management Plan Version 8. May 3, 2018

Diavik Diamond Mines (2012) Inc., 2018b. Seepage Survey 2017 Annual Report. March 31, 2018

Diavik Diamond Mines (2012) Inc., 2017. Report on A-Portal Waste Rock Misclassification. July 3, 2017

Wek'èezhìi Land and Water Board, 2018. Closure and Reclamation Plan Version 4.0. Decision from the Wek'èezhìi Land and Water Board Meeting of December 7, 2018.

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Yellowknife, NT X1A 2P8 Canada
T (867) 669 6500 F 1-866-313-2754

Joseph Mackenzie, Chair
Wek'èezhìi Land and Water Board
PO Box 32
Wekweètì, NT X0A 1W0
Canada

13 February 2019

Dear Mr. Mackenzie:

Subject: DDMI Response to Reviewer Comments and Recommendations re: Diavik A-Portal Waste Rock Mishandling Investigation Summary Report

Diavik Diamond Mines (2012) Inc. (DDMI) is pleased to provide the Wek'èezhìi Land and Water Board ('the Board') with its response to reviewer comments and recommendations regarding DDMI's Diavik A-Portal Waste Rock Mishandling Investigation Summary Report (the Report) submitted to the Board on October 4, 2018.

DDMI wishes to highlight the following points:

- The total proportion of mishandled A-Portal Type III rock that was incorporated into surface construction is approximately 0.03% of the Waste Rock on site.
- There is no evidence to suggest that 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 the affected areas.
- To date, seepage has not been observed flowing out from the laydowns or roadways in the affected areas.
- In the absense of site specific closure criteria, parameter limits in Metal and Diamond Mining Effluent Regulations (MDMER) guidelines are the most appropriate action levels for managing potential impacts to water quality related to the mishandling of waste rock types. 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 agrees with Government of Northwest Territories - Department of Environment and Natural Resource'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.

As part of its response, DDMI has committed to the following:

- Documenting the presence of potential Type III rock in the Waste Rock Management Plan and associated reports.

- Continue to conduct Seepage Surveys for areas constructed with mined or quarried rock on site.
- Update the Seepage Survey Report to discuss the main A-Portal Impacted Areas identified in Section 3 of the Report. This information will be included in the 2019 Seepage Survey Report following 2019 seepage monitoring. Monitoring will apply added scrutiny to the main impacted areas and summarize the presence/absence of seepage from these areas, including the results of any analysis.
- Commencing seepage sampling if new seepage generation/flow is identified at the A-Portal Impacted Areas described in Section 3 of the Report. The specific situation would be assessed with input from the Inspector and a new Surveillance Network Program station may be activated.

In summary, DDMI believes it has demonstrated an understanding of the implications of the mishandling of A-Portal waste rock, and has developed appropriate monitoring programs with specific action triggers to mitigate potential impacts to the receiving environment. Further, DDMI has put in place operating procedures to prevent a recurrence of the waste rock mishandling incident across the project site.

DDMI's response to reviewer comments and recommendations has been uploaded to the Board's Online Review System.

Please do not hesitate to contact the undersigned if you have any questions related to this submission.

Sincerely,

Sean Sinclair
Superintendent, Environment

cc: Anita Ogaa, WLWB
Anneli Jokela, WLWB