



November 04, 2022

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RE: Submission of 2022 Geotechnical Inspection Report No. 2 (September 2022)

Under Part D, Item 18 of Baffinland Iron Mines Corporation's (Baffinland) Type "A" Water Licence 2AM-MRY1325 Amendment No. 1 (Water Licence), Baffinland is required to conduct biannual geotechnical inspections of specified Mary River Project (the 'Project') infrastructure. Part D, Item 18, of the Water Licence states that:

"The Licensee shall conduct inspections of the earthworks and geological and hydrological regimes of the Project biannually during the summer or as otherwise approved by the Board [Nunavut Water Board] in writing. The inspection shall be conducted by a Geotechnical Engineer and the inspection report shall be submitted to the Board within sixty (60) days of the inspection, including a cover letter from the Licensee outlining an implementation plan to respond to the Engineer's recommendations."

The second geotechnical inspection for 2022 was conducted by Laszlo Bodi, M.Sc., P.Eng., Principal Civil/Geotechnical Engineer with Wood Environment and Infrastructure Solutions. The focus of the inspection was on the Water Licence related infrastructure located at the Mary River Mine Site and Milne Port. The second geotechnical inspection for 2022 was conducted between August 31st and September 7th, 2022.

During the inspection, the following structures and facilities were inspected:

Mary River Mine Site

- a) Berms of Polishing/Wastewater Stabilization Ponds (3)
- b) Berms of hazardous waste disposal cells - (HWB-1 to HWB-7)
- c) MS-06, MS-07, MS-08 and MS-11 surface water collection/settling ponds and adjacent ditches
- d) Berms of the generator fuel bladder cell (located adjacent to the generators)
- e) Fuel storage farms (3) – Aerodrome jet-fuel storage, MS-03 and MS-03B diesel fuel farms
- f) Solid-waste disposal site (non-hazardous landfill facility)
- g) Camp Lake silt sedimentation check dams and berms
- h) Rock fill slope (riprap) at the water (effluent) discharge area
- i) Deposit 1 pit walls
- j) QMR2 and D1Q1 rock quarries, and KM106 run-of-mine ore storage area

Milne Inlet Port Site

- a) Berms of hazardous waste disposal cells - (HWB-1 through to HWB-4)
- b) Berms of the MP-01A Polishing Waste Stabilization Pond (PWSP)
- c) Berms of the MP-03 fuel tank farm
- d) Berms of the MP-04 landfarm and MP-04A contaminated snow disposal pond
- e) Berms of Pond #3, MP-05, and MP-06/MP-06A settling ponds and drainage ditches
- f) Q01 rock quarry and north quarry ditch system
- g) Surface water collection ditches (P-SWD-3, -5, -6, -7, W3/W14, 380M pad and PSC ditches)
- h) Tote Road culverts (conveying surface water from the Q01 rock quarry area)
- i) Rock fill slope (riprap) at the water (effluent) discharge area
- j) LP-5 Storage Pad

Milne Inlet Tote Road

- a) Bridges (4)
- b) Representative Former Borrow Areas Along the Tote Road (4)
- c) Section of the Haul Road Between the Crusher Pad and the Deposit 1 Open Pit

The attached report (Attachment 1) presents the findings and recommendations of the September 2022 inspection for the aforementioned structures. The following subsections of this letter summarize completed actions from the first 2022 geotechnical inspection, and Baffinland's plan for implementing the recommendations identified in the second 2022 geotechnical inspection report.

Completed Actions from the First 2022 Geotechnical Inspection

Mary River Hazardous Waste Berms (HWB 2)

Baffinland completed the clean-up of the wood pallets and debris in HWB 2.

Mary River Hazardous Waste Berm (HWB 6)

Baffinland completed the levelling and grading in HWB 6.

Mary River Hazardous Waste Berm (HWB 7)

Baffinland completed treatment and discharge of water to maintain adequate freeboard in HWB 7.

Mary River Historic Generator Fuel Bladder Berm

Baffinland completed the road and berm remedial improvements to restore the water management in the Generator Fuel Bladder Berm area.

Milne Port Hazardous Waste Berms (HWB 3 and 4)

Baffinland completed the regrading at the entrance of HWB-3/HWB-4.

Milne Port MP-05 Surface Water Management Pond

Baffinland completed the liner repairs at MP-05.

W3/W14 Surface Water Collection Ditch and Culvert

Baffinland completed the construction of the W3/W14 ditch, including covering the base and side-slopes with crushed rock fill.

Recommendations for the Mary River Mine Site Infrastructure from the Second 2022 Geotechnical Inspection

MS-06 - Surface Water Management Pond Adjacent to the Crusher Facility (CF)

The temporary containment sump adjacent to the toe of the south berm of the MS-06 pond should be backfilled with native soil, as soon as possible.

Baffinland Action: This has been completed.

The inlet of the culvert under the crusher pad entrance was partly clogged with soil. The soil must be removed to restore proper drainage through the culvert. Extension of the culvert is also suggested to prevent future clogging of this corrugated drainage pipe.

Baffinland Action: The soil was removed from the inlet of the culvert, and drainage has been restored. Baffinland will monitor the culvert during the 2023 open water season to determine if an extension of the culvert is required.

MS-07 - Surface Water Management Pond Adjacent to the KM106 ROM Facility

It is recommended to cover the base and slopes of the temporary containment sump adjacent to the Facility Diversion Berm with riprap.

Baffinland Action: The sump will be covered with rip rap when the site is accessible in Q2 2023.

MS-08 – Surface Water Management Pond Adjacent to the Waste Rock Facility (WRF)

A section of the rock fill berm and liner at the south west berm of the WTP Geotube pond is damaged. The damaged berm section and liner should be repaired as soon as practically possible.

Baffinland Action: Baffinland will repair the damaged berm section and liner when the contractors are on site during summer 2023. A field investigation determined that there is minimal risk to the Geotube pond capacity due to the location of the damage on the top of the crest (Completion Q3 2023).

One section along the west perimeter collection ditch of the WRF is blocked by waste rock. It is suggested to excavate a new section of the ditch to facilitate easier flow of surface water to the pond. Removal of waste rock from the existing ditch would result in more boulders rolling down from the adjacent steep waste rock slope into the ditch, hence, the excavation of a new ditch section would be preferred.

Baffinland Action: Baffinland will restore flow in the west perimeter collection ditch prior to freshet 2023.

MS-11 – Surface Water Management Pond and Dam at KM105

Some frost related damages were observed during the first inspection in 2022 along the road next to the southern zone of the MS-11 pond's slope. During the second inspection, some crushed stone was observed placed in some of the cracks however was not complete at the time. The cracks must be completely regraded/filled and compacted as soon as practically possible to prevent water collection in those cracks in the future.

Baffinland Action: Baffinland will review the potential frost related damages to the south embankment with the design engineer during 2023 repair work to correct the above observation, and implement corrective actions as per the design engineer's recommendations.

Mary River Landfarm

The slopes of the berms (upstream and downstream) appear to be steeper than the design. Also, the loose granular material anchoring the liner on the top of the berms has settled significantly, resulting in a long depression along the top of the berms. The water in the sump has resulted in slumping of the granular cover layer on top of the liner, which resulted in slumping of the granular cover layer on the slope of the berms. It is recommended that the deficiencies be repaired/rectified in both cells. The problems should also be considered (lessons learned) in the design and construction of the still planned two additional cells to prevent such problems in the future.

Baffinland Action: Baffinland will complete this prior to the end of Q3 2023.

QMR2 Rock Quarry

Ponding water continues to cover a section of the main level of the quarry, with potential to cause slope stability and traffic safety issues in the area. To maintain traffic safety and stable side slopes when the operation in this facility resumes, the ponding water at the quarry's main level should be properly drained from the area down on the side-slope located immediately next to the plateau. It is recommended that consideration be given to the installation of a slope-drain pipe, chute, or flume drain, as an erosion protection measure.

Baffinland Action: Baffinland will review this requirement with the design consultant that is currently assisting with Modification No. 13 Water Management Plans, to include an assessment of the QMR2 drainages. The plan will be in place prior to Freshet 2023, and the plan will be actioned during the summer of 2023.

D1Q1 Quarry

A few boulders were observed close to the edge of the crest of the slope of the D1Q1 quarry, from the overburden left in place on the upper ground surface. The soil cover on the top of the rock slope should be scaled back once the operation will restart in the quarry.

Baffinland Action: Baffinland will complete this prior to freshet 2023.

Recommendations for Milne Port Infrastructure from the Second 2022 Geotechnical Inspection

MP-04A

The geotextile was noted to be damaged in two areas on the access ramp to MP-04A, although there was no damage to the liner noted. It is recommended that the granular fill be carefully removed from the area and the damaged geotextile be replaced, followed by the placement of additional granular fill cover layer. The placement of somewhat thicker granular fill is recommended on the ramp and over the top of the berm in this area to assist in future prevention of a similar issue.

Baffinland Action: Baffinland will complete this prior to the end of Q3 2023.

Surface Water Drainage Ditch - P-SWD-3

Sloughing of the sides of the P-SWD-3 ditch, adjacent to the LP2 laydown area, has occurred at several locations along the ditch however the ditch is not able to convey the collected water to the required location. To improve the drainage capability of this ditch, it is recommended that it should be redesigned and reconstructed to drain the large amount of surface water from the snow-dump to the north-east. The design must consider the fact that large amount of snow is stockpiled adjacent to this ditch every winter that generates excessive quantity of run-off water in the spring/summer that must be drained more efficiently toward the north-east. It is also suggested that a perimeter diversion berm be provided around the snow stockpile area and the surface water generated by the melting snow be conveyed to the P-SWD-3 ditch in a separate new drainage ditch.

Baffinland Action: Baffinland will complete the remaining improvement work in this drainage ditch in 2023. A review of the water management design in this area is required, to include consideration of snow stockpile melt, which will occur prior to Freshet 2023. The resulting remedial plan will be implemented when ground conditions permit in Q3 2023. In the interim, all water will continue to be actively pumped downstream of this area to the proper receiving location until permanent remedial work to the drainage ditch is complete.

Surface Water Drainage Ditch - P-SWD-5

A short section of the P-SWD-5 ditch was noted with missing riprap and continuous water seepage from the side-slope was observed resulting in the periodic sloughing/erosion of the side of the ditch along this short section. It is recommended that the finer soil, currently forming the side of the ditch, be removed to a depth of around 1 m and replaced with crushed rock fill. To minimize migration of fine soil particles from the quarry pad to the ditch, the crushed rock fill should be placed over geotextile. There is also a clogged culvert along this ditch, located beneath the road at the entrance to the quarry. The clogged culvert should be cleaned or replaced if necessary; preferably with a larger diameter culvert.

Baffinland Action: Baffinland will review Q1 quarry water management requirements and have a remedial plan prepared by Freshet 2023.

Surface Water Drainage Ditch – PSC

Minor localized slope movements/failure at the west end of the ditch should be repaired, regraded and the riprap rock fill cover reinstated. The sloughing of the slope is apparently caused by frequent water seepage from the granular fill of the LP-2 laydown that likely is a result of the inefficient drainage of

surface water from the P-SWD-3 ditch that seeps into the LP-2 laydown and most likely exits at the location in the PSC ditch requiring repairs. Once the drainage conditions in the P-SWD-3 ditch are improved/rectified, the failed slope at the PSC ditch can also be repaired. Consideration should be given to reshape the west section of the ditch and reinstall the culvert to a lower invert level to prevent ponding in this section of the ditch.

Baffinland Action: Baffinland will repair and regrade the identified area in the ditch where localized slope movements/failure have occurred and reinstate the riprap rock cover in Q2 2023. Baffinland will inspect in Q2 2023 and, if required, repair the invert level of the west ditch section culvert, prior to completion of the construction of the PSC drainage ditch.

Milne Port WWTP Effluent Discharge

The sandy valley floor downstream of the WWTP effluent discharge location requires additional crushed rock fill over geotextile to prevent erosion and undermining of the adjacent two embankment slopes.

Baffinland Action: Baffinland will complete this prior to the end of Q3 2023.

LP-5 Laydown

A network of natural cracks and depressions were noted on the surface at the edge of the LP-5 Laydown, and periodic formation and thawing of ice wedges resulted in a network of “stripes” (depressions/ cracks) within the active layer of the laydown. It was suggested to fill the cracks with the same material that was used for the laydown construction (sand and gravel), to minimize ice-wedge development in the future.

Baffinland Action: Baffinland will complete this prior to Freshet 2023.

Tote Road KM17 Bridge

Some elements of the steel bolt-a-bin structure are damaged. The damaged elements should be removed, together with part of the sandy backfill from behind them (from the face of the abutment). The sand should then be replaced with clean crushed rock fill to prevent erosion of the finer soil from the old abutments.

Baffinland Action: Baffinland will remove the old abutment structure when ground conditions permit in summer 2023.

Tote Road Borrow Pits

When the historic borrow pits at KM 6.9 and 7.7 were infilled, the base of the borrow area was leveled/graded, just slightly above the crest elevation of the adjacent road. The poor grade control and lack of drainage ditch can result in unwanted surface water flow onto the road from both sides, wherever the surface of the road is located at somewhat lower elevation. It is recommended that critical road sections with such poor grade and drainage controls be mapped, and the drainage conditions be improved by providing adequate side-ditches along the road, wherever the elevation of the road surface is located somewhat lower than the adjacent ground surface. The drainage ditches should be constructed as specified in the Project’s Civil Design Criteria and Drawings.

Baffinland Action: Baffinland will review these locations and action earthworks to ensure proper drainage is maintained following backfill of these borrow pits.

The toe of the slope at the historic borrow pit at KM28.9 to KM29 is located somewhat closer to the edge of the road and the slope appears to be as steep as 1H:1V. The raveling face of the slope and the development of tension cracks indicate further slumping of the slope can be expected in the future. Although there is no immediate risk to the traffic on the road, the sloughing soil from the steep slope is filling up the drainage ditch along the road, preventing surface water from flowing in the ditch. At the subject road section, it is suggested that the slope should be reshaped (cut back) to shallower inclination (preferably to 2H:1V) and the drainage ditch be cleaned of soils, as soon as practically possible.

Baffinland Action: Baffinland will complete this when ground conditions permit in Q3 2023.

We trust that this submission meets the requirements for geotechnical inspections as outlined in the Water Licence. Should you have any questions, please do not hesitate to contact the undersigned.

Regards,



Connor Devereaux
Environmental Manager

Attachments:

Attachment 1: 2022 Geotechnical Inspection Report No. 2

Cc: Karén Kharatyan (NWB)
Chris Spencer, Hugh Karpik (QIA)
Lauren Perrin, Omer Pasalic, Jeremy Fraser (CIRNAC)
Tim Sewell, Megan Lorde-Hoyle, Lou Kamermans, Sylvain Proulx, Francois Gaudreau, Martin Beausejour, Todd Swenson, Kendra Button, Allison Parker (Baffinland)



Attachment 1

2022 Geotechnical Inspection Report No. 2