Photo 13A: Example of enhance armoring at KM74. Note accumulation of sediment on the surface or riprap above the culvert. Annual maintenance should ensure that all armoring is left in a condition that allows effective sediment management during the annual freshet,

Photo 13B: View looking upstream towards culvert pictured in Photo 13A. Note that armoring appears to be incomplete with areas of exposed bare soil downstream of the silt fencing on the right side of the photo.

Photo 14: View of installed coconut coir log that needs the sediment accumulated upstream of it removed so that it can continue to function. As seen in the picture, it is evident that the sediment accumulation has resulted in the creation of a ramp that would make it easy for sediment laden waters to overtop the log during future sediment transport events.

Photo 15A: View of damage starting to happen to parked vehicles at staging area near KM 7 as erosion gully develops beneath them.

Photo 15B: View of channel that conveys flow west of equipment staging area.

Photo 15C: View of erosion channel that has developed beneath parked vehicles at KM 7 staging area.

Photo 16: View (looking east) of west side of weather haven and ship loader caked with fine ore dust that has been transported by the wind from the fine ore stock pile locate south and west of the ship loader.

Appendix C
MISL KM105 Pond Figures

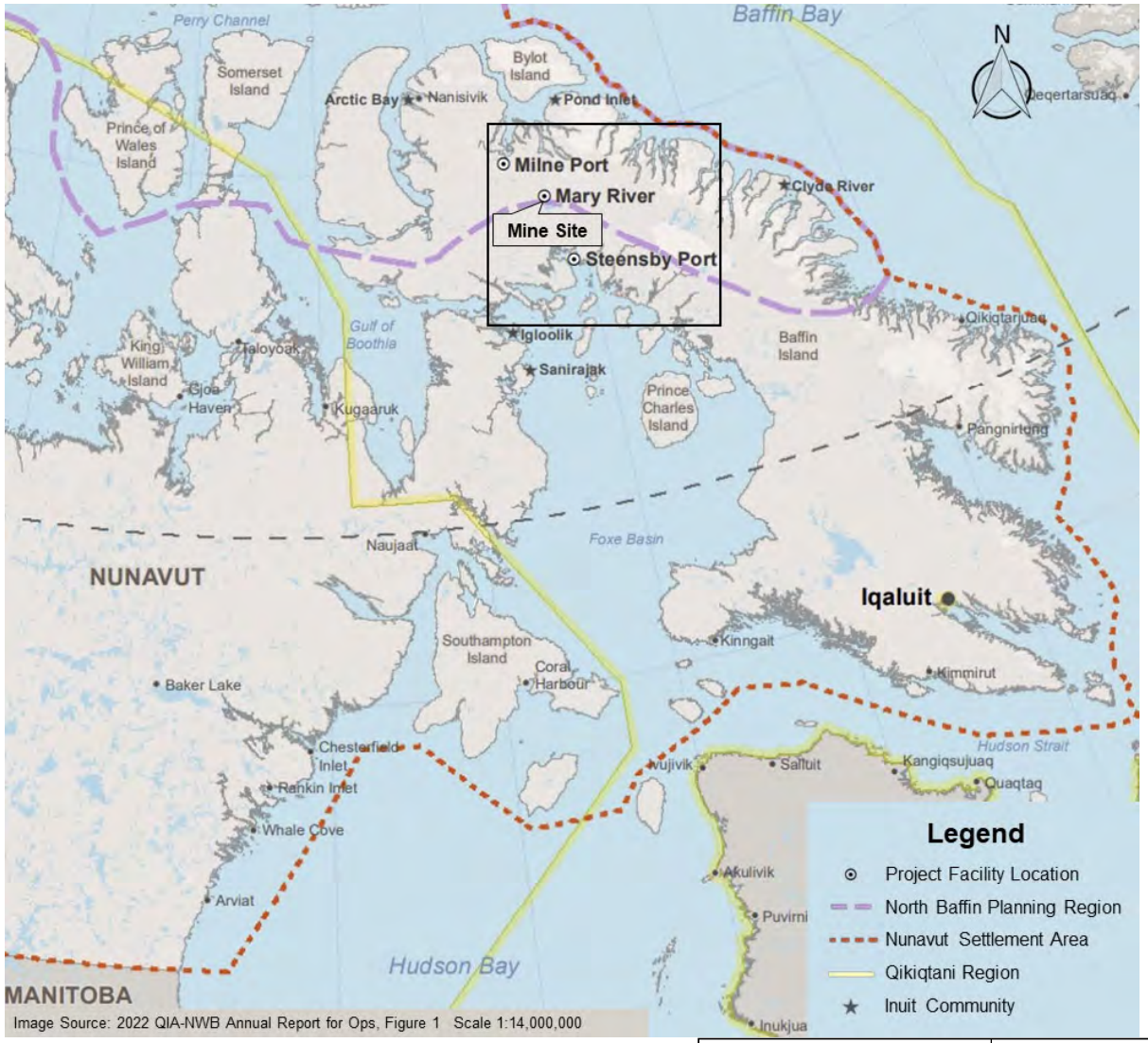
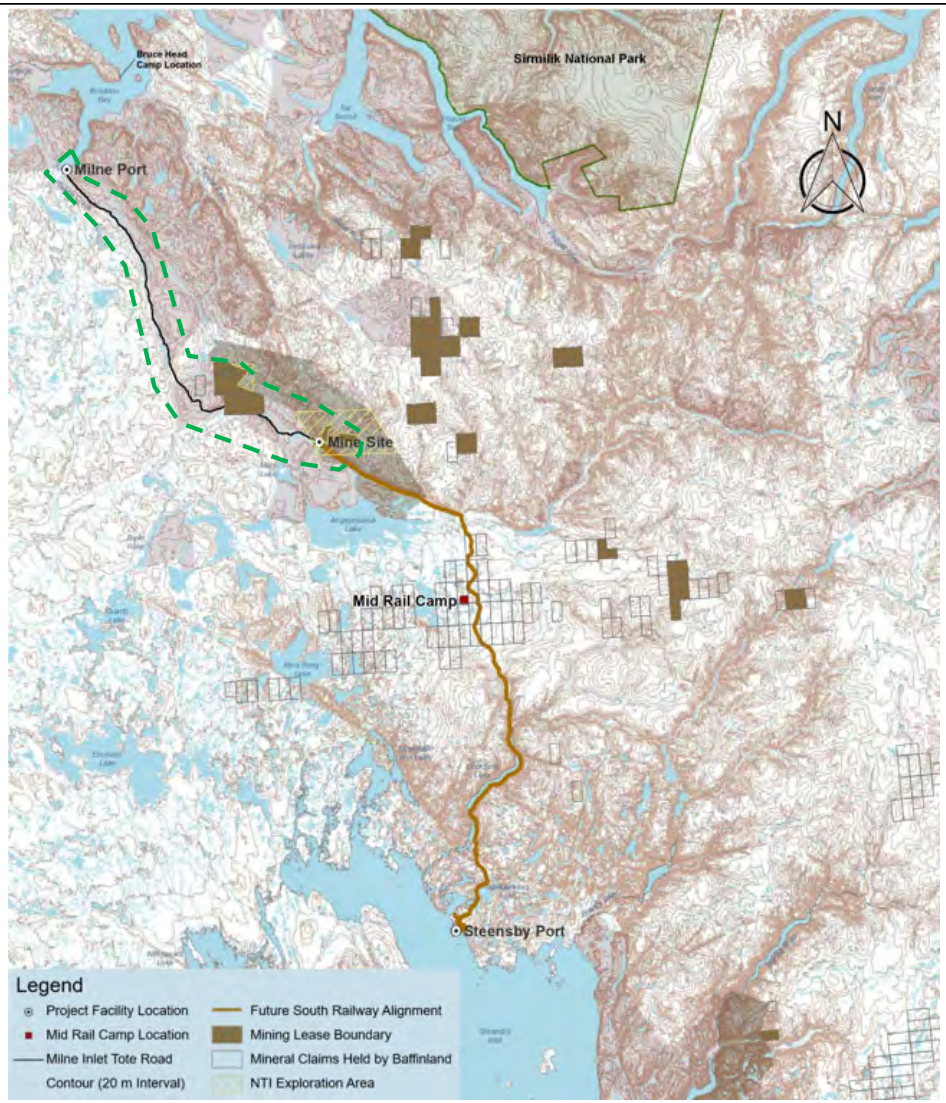


Image Source: 2022 QIA-NWB Annual Report for Ops, Figure 1 Scale 1:14,000,000

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
		Mary River Project Location Map
Mining Impact Specialists Ltd.	LGL Limited	Date: 1 Sep 2023 / Approved: LEB / FIGURE 1



- Approximate limits of areas inspected during the June 2023 site visit.

Image Source: 2022 QIA-NWB Annual Report for Operations

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
		Project Site Overview
Mining Impact Specialists Ltd.	LGL Limited	Date: 1 Sep 2023 / Approved: LEB / FIGURE 2

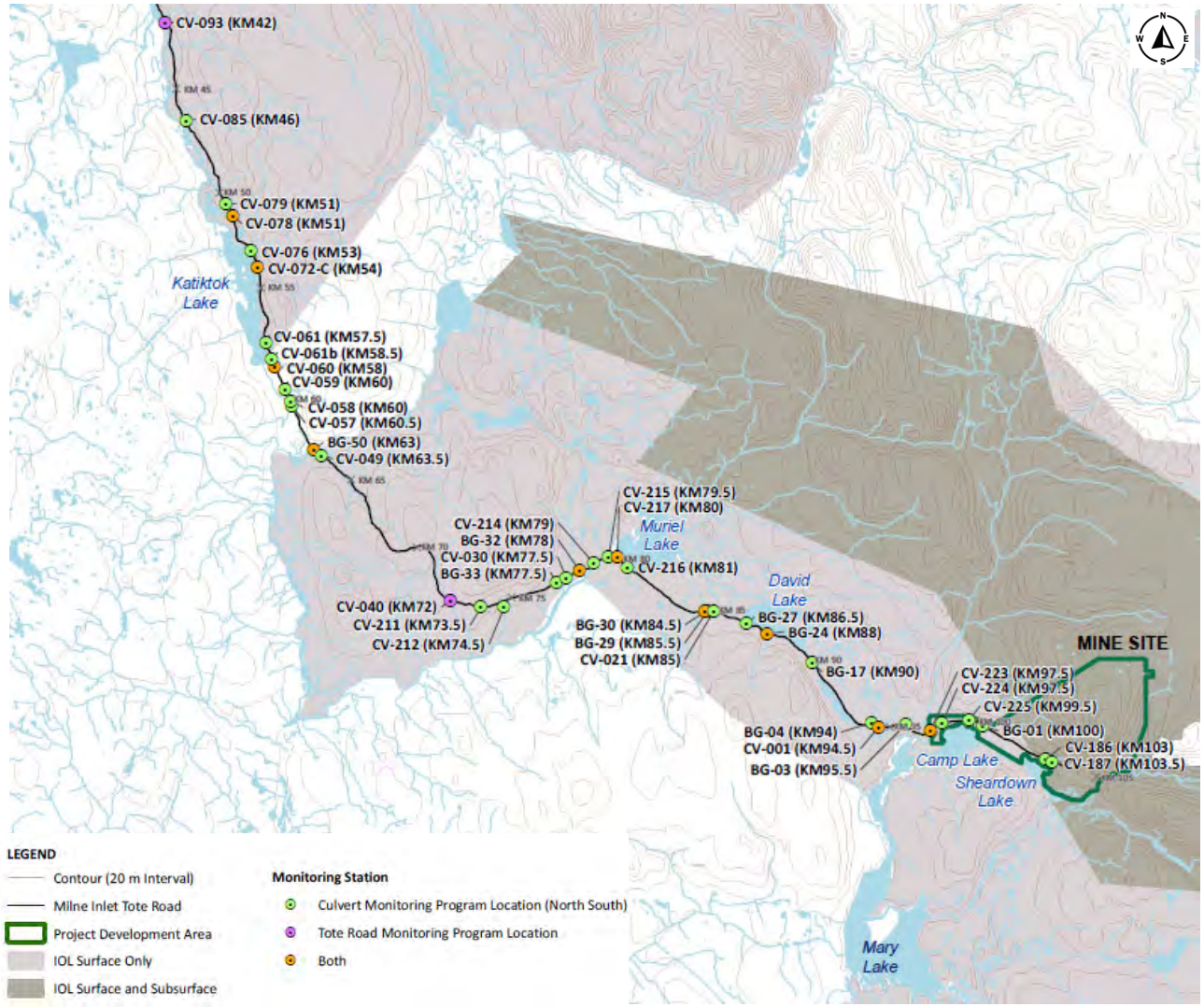


Image Source: Follow-Up Spill Report for Spill #2023-258, Baffinland (July 16, 2023)

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
Mining Impact Specialists Ltd.	LGL Limited	**Tote Road Monitoring Program KM 103.5 – KM 42**
		Date: 11 Sep 2023 | Approved: LEB | FIGURE 3

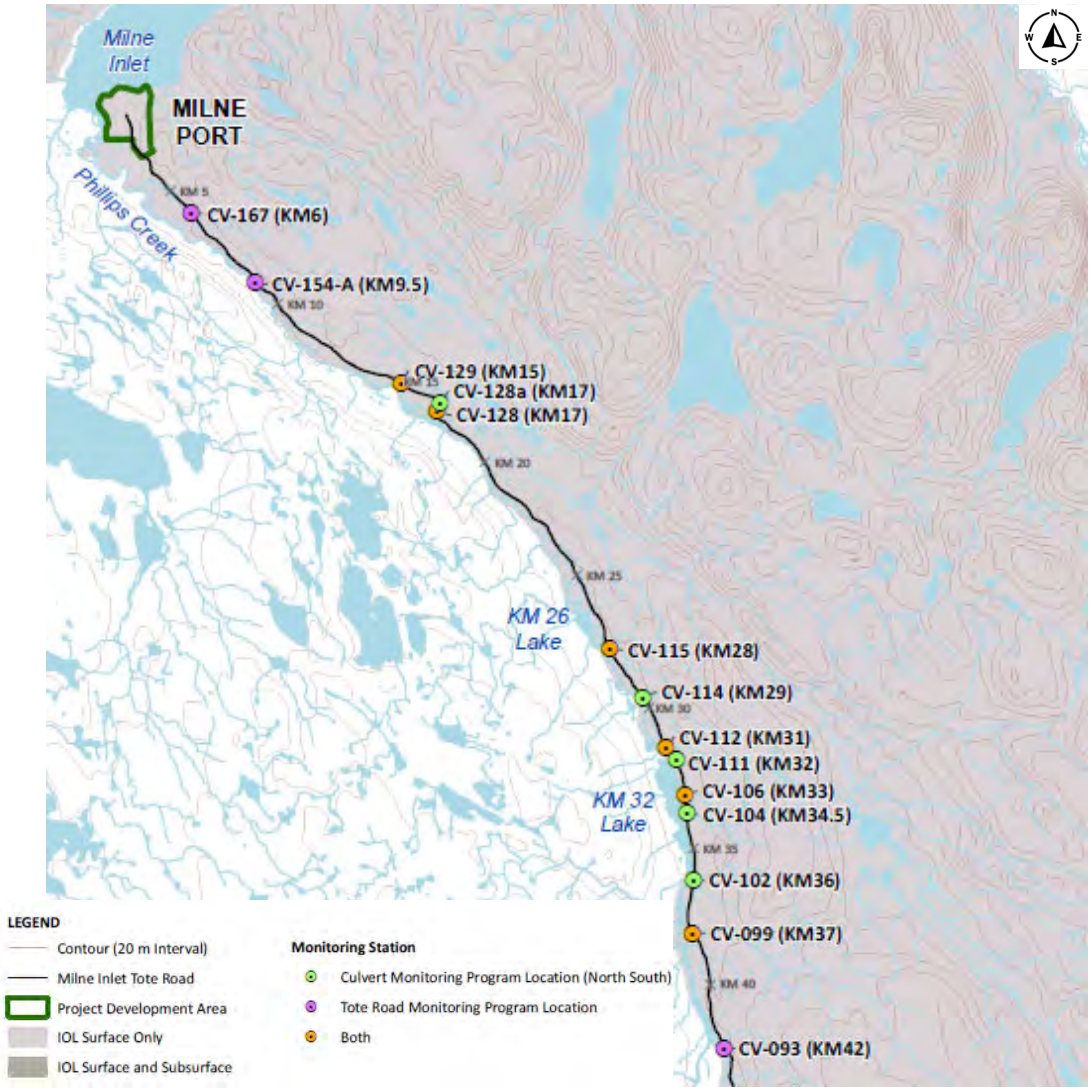


Image Source: Follow-Up Spill Report for Spill #2023-258, Baffinland (July 16, 2023)

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
Mining Impact Specialists Ltd.	LGL Limited	**Tote Road Monitoring Program KM 42 - KM 1**
		Date: 1 Sep 2023 / Approved: LEB / FIGURE 4

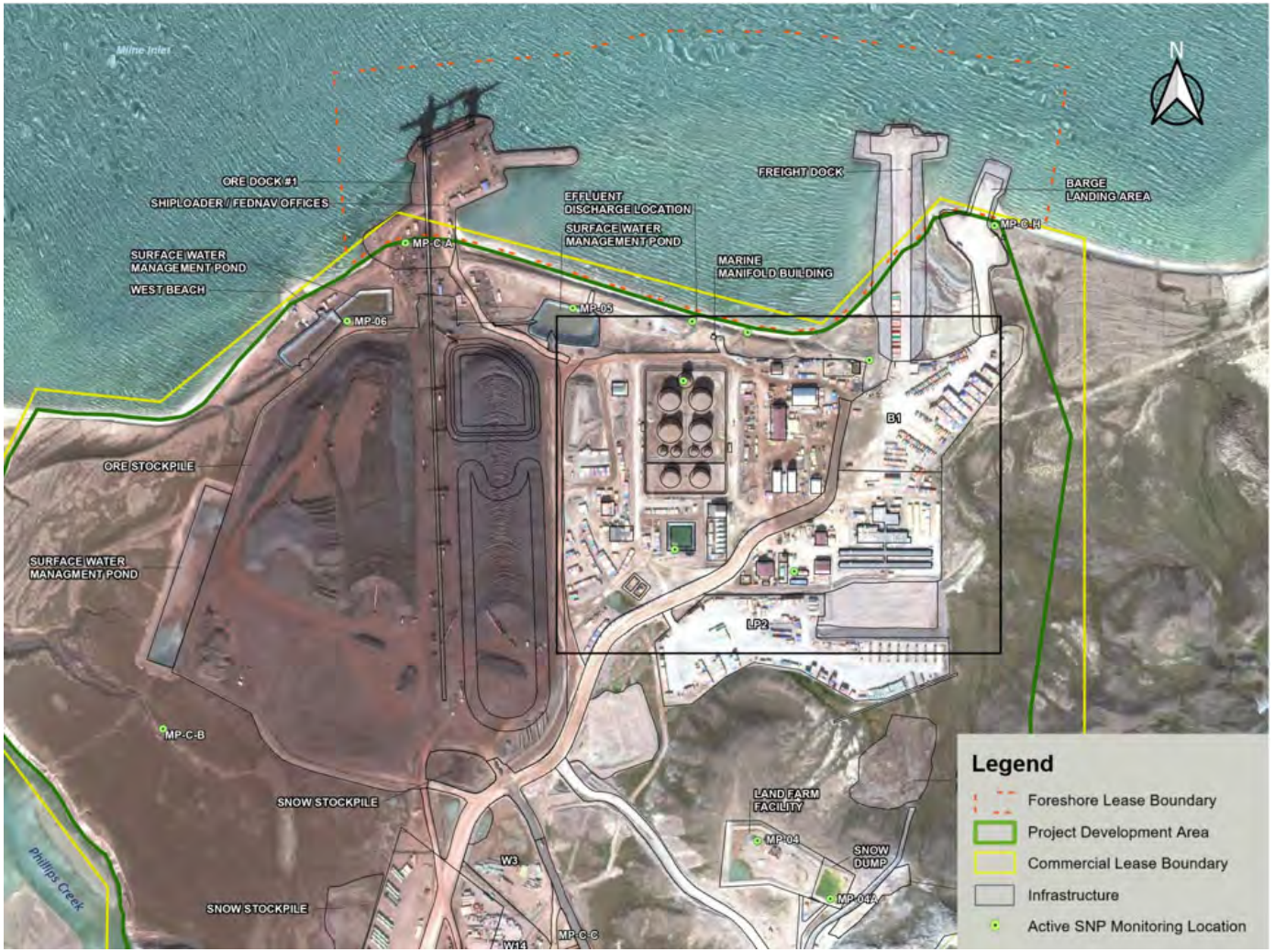


Image Source: 2022 QIA-NWB Annual Report for Operations

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
		Milne Port Site Overview North
Mining Impact Specialists Ltd.	LGL Limited	Date: 1 Sep 2023 / Approved: LEB / FIGURE 5

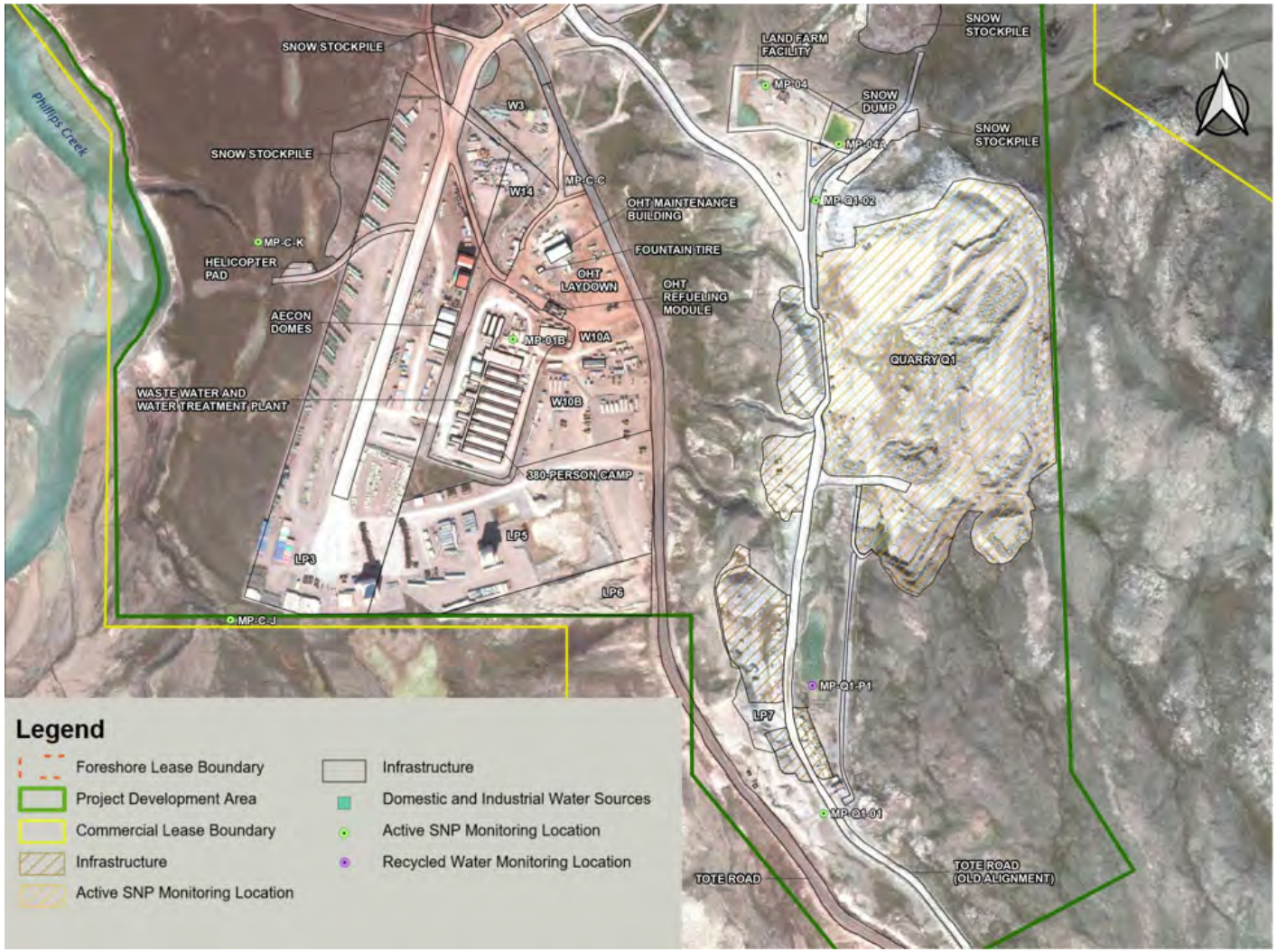


Image Source: 2022 QIA-NWB Annual Report for Operations

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
Mining Impact Specialists Ltd.	LGL Limited	**Milne Port Site Overview South**
		Date: 1 Sep 2023 / Approved: LEB / FIGURE 6

Image Source: 2022 QIA-NWB Annual Report for Operations

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
		Milne Port Site Infrastructure
Mining Impact Specialists Ltd.	LGL Limited	Date: 1 Sep 2023 / Approved: LEB / FIGURE 7

LEGEND

- Borrow Area
- Quarry Area
- Project Development Area
- Commercial Lease Boundary
- Infrastructure
- Domestic and Industrial Water Sources

SNP Monitoring Station

- Active
- Inactive

Monitoring Location

- Recycled Water Monitoring
- Snow Stockpile Monitoring
- Tote Road Monitoring

- Location mentioned in spill report named in Inspection report.

Image Source: 2022 QIA-NWB Annual Report for Operations

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
Mining Impact Specialists Ltd.	LGL Limited	**Active Mining Area, Waste Rock Facility, & WTP**
		Date: 11 Sep 2023 | Approved: LEB | FIGURE 8

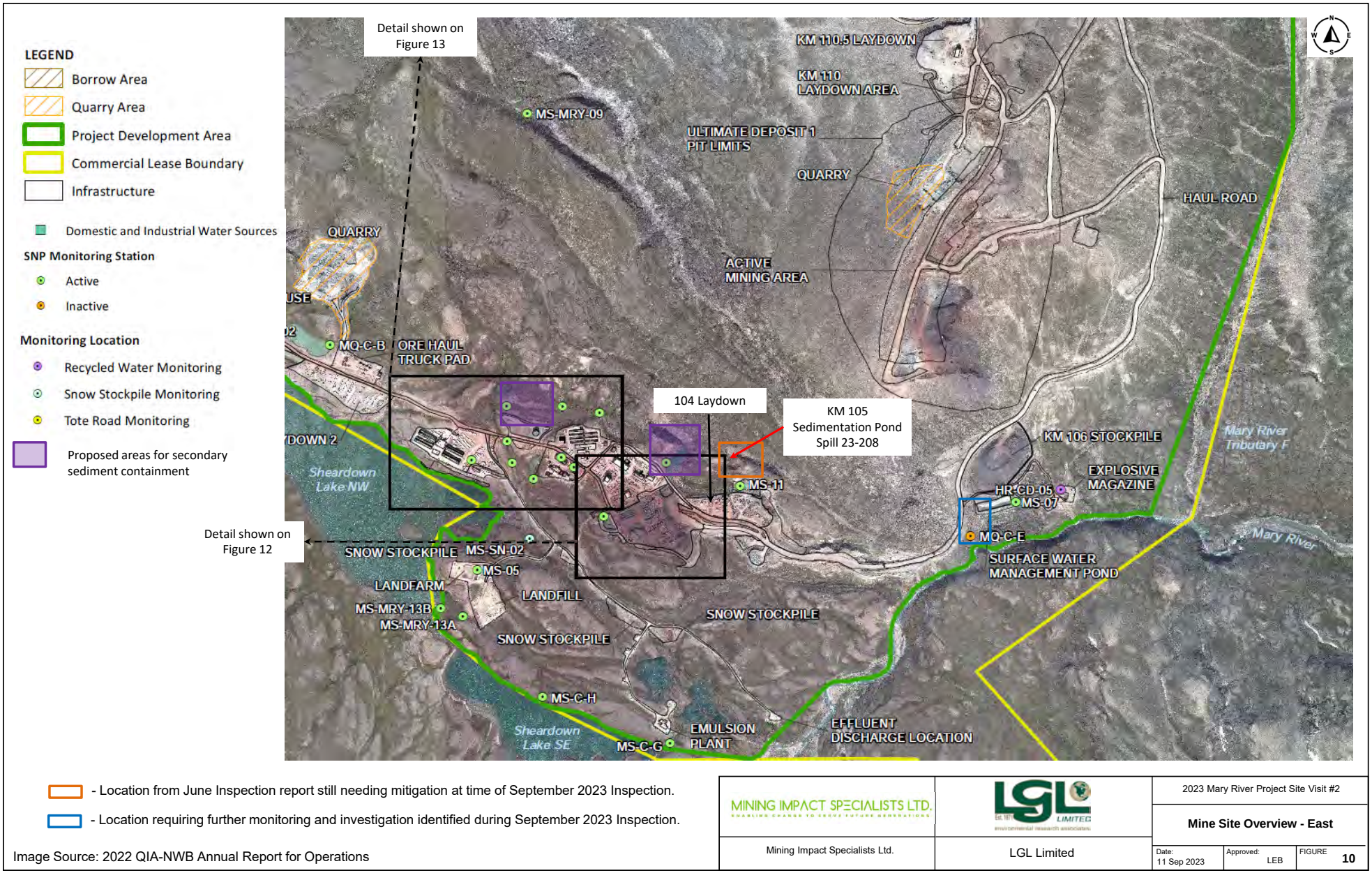
LEGEND

Area of interest/concern from June 2023 Inspection.

Area of where ultrafines have been stored and will be managed.

Image Source: Supplemental information for KM 106 spill event provided by Baffinland via e-mal on 10 Aug 2023.

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
		KM 106 Ore Storage Facility
Mining Impact Specialists Ltd.	LGL Limited	Date: 11 Sep 2023 / Approved: LEB / FIGURE 9



- Location from June Inspection report still needing mitigation at time of September 2023 Inspection.

- Location requiring further monitoring and investigation identified during September 2023 Inspection.

Image Source: 2022 QIA-NWB Annual Report for Operations

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
		Mine Site Overview - East
Mining Impact Specialists Ltd.	LGL Limited	Date: 11 Sep 2023 | Approved: LEB | FIGURE **10**

LEGEND

Area of interest/concern or recommended action

Image Source: Follow-Up report for Spill #2023-208, Baffinland, 20 June 2023

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
		KM 105 Sedimentation Pond
Mining Impact Specialists Ltd.	LGL Limited	Date: 11 Sep 2023 / Approved: LEB / FIGURE 11

LEGEND

- Borrow Area
- Quarry Area
- Project Development Area
- Commercial Lease Boundary
- Infrastructure
- Domestic and Industrial Water Sources

SNP Monitoring Station

- Active
- Inactive

Monitoring Location

- Recycled Water Monitoring
- Snow Stockpile Monitoring
- Tote Road Monitoring

Area downstream of KM 105 NW Embankment that functioned as a secondary sedimentation pond during 2023 Freshet.

- Location mentioned in spill report named in Inspection report.

Image Source: 2022 QIA-NWB Annual Report for Operations

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
Mining Impact Specialists Ltd.	LGL Limited	**Crusher & Maintenance Areas**
		Date: 11 Sep 2023 / Approved: LEB / FIGURE 12

LEGEND

- Borrow Area
- Quarry Area
- Project Development Area
- Commercial Lease Boundary
- Infrastructure
- Domestic and Industrial Water Sources

SNP Monitoring Station

- Active
- Inactive

Monitoring Location

- Recycled Water Monitoring
- Snow Stockpile Monitoring
- Tote Road Monitoring

Area downstream of KM 105 NW Embankment where heavily sediment-laden seepage was observed, ultimately reporting to Sheardown Lake.

- Location needing repair/maintenance.
- Repair/improvement observed during September 2023 Inspection.

Image Source: 2022 QIA-NWB Annual Report for Operations

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
		Mine Camp & Site Complex
Mining Impact Specialists Ltd.	LGL Limited	Date: 11 Sep 2023 | Approved: LEB | FIGURE 13

LEGEND

- Freshet Monitoring Location
- Project Development Area
- Location mentioned in spill report named in Table 1 of report.

Image Source: 2022 QIA-NWB Annual Report for Operations

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
Mining Impact Specialists Ltd.	LGL Limited	**Freshet Monitoring Locations at Mine Site**
		Date: 11 Sep 2023 / Approved: LEB / FIGURE 14

Image Source: 2022 QIA-NWB Annual Report for Operations

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
Mining Impact Specialists Ltd.	LGL Limited	**Mine Site Overview - West**
		Date: 11 Sep 2023 | Approved: LEB | FIGURE 15

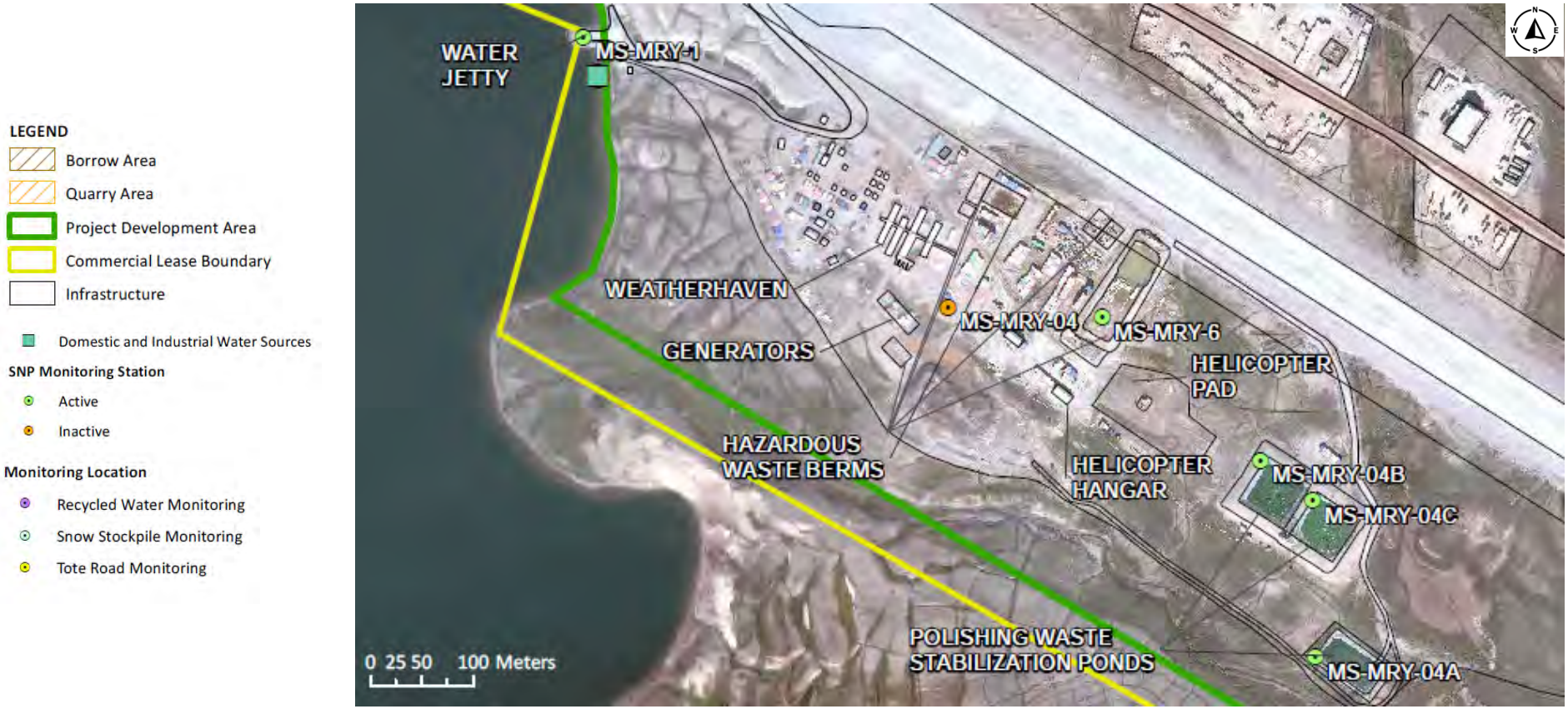
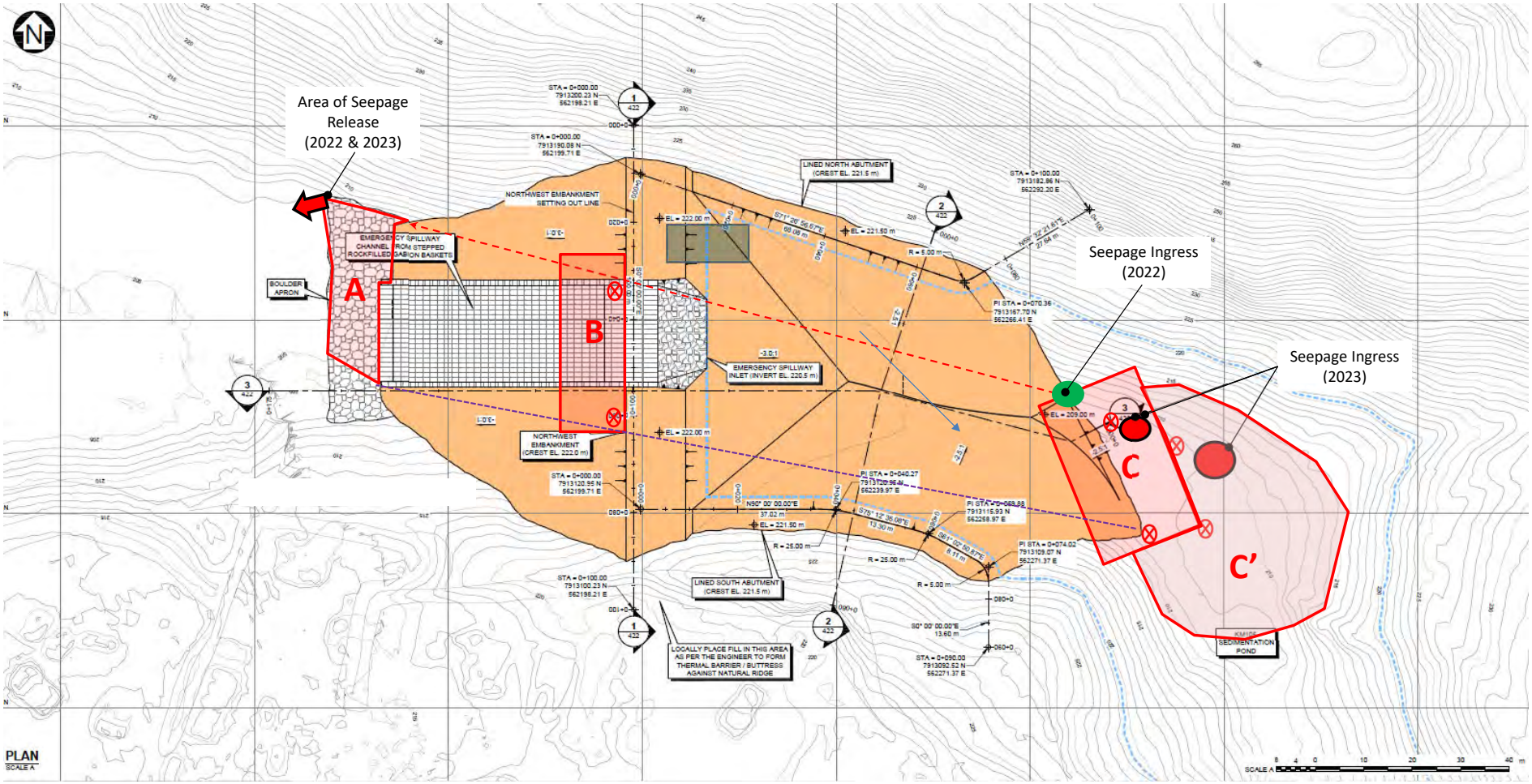


Image Source: 2022 QIA-NWB Annual Report for Operations

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
Mining Impact Specialists Ltd.	LGL Limited	**Aircraft Landing Areas East of Camp Lake**
		Date: 11 Sep 2023 / Approved: LEB / FIGURE 16



LEGEND

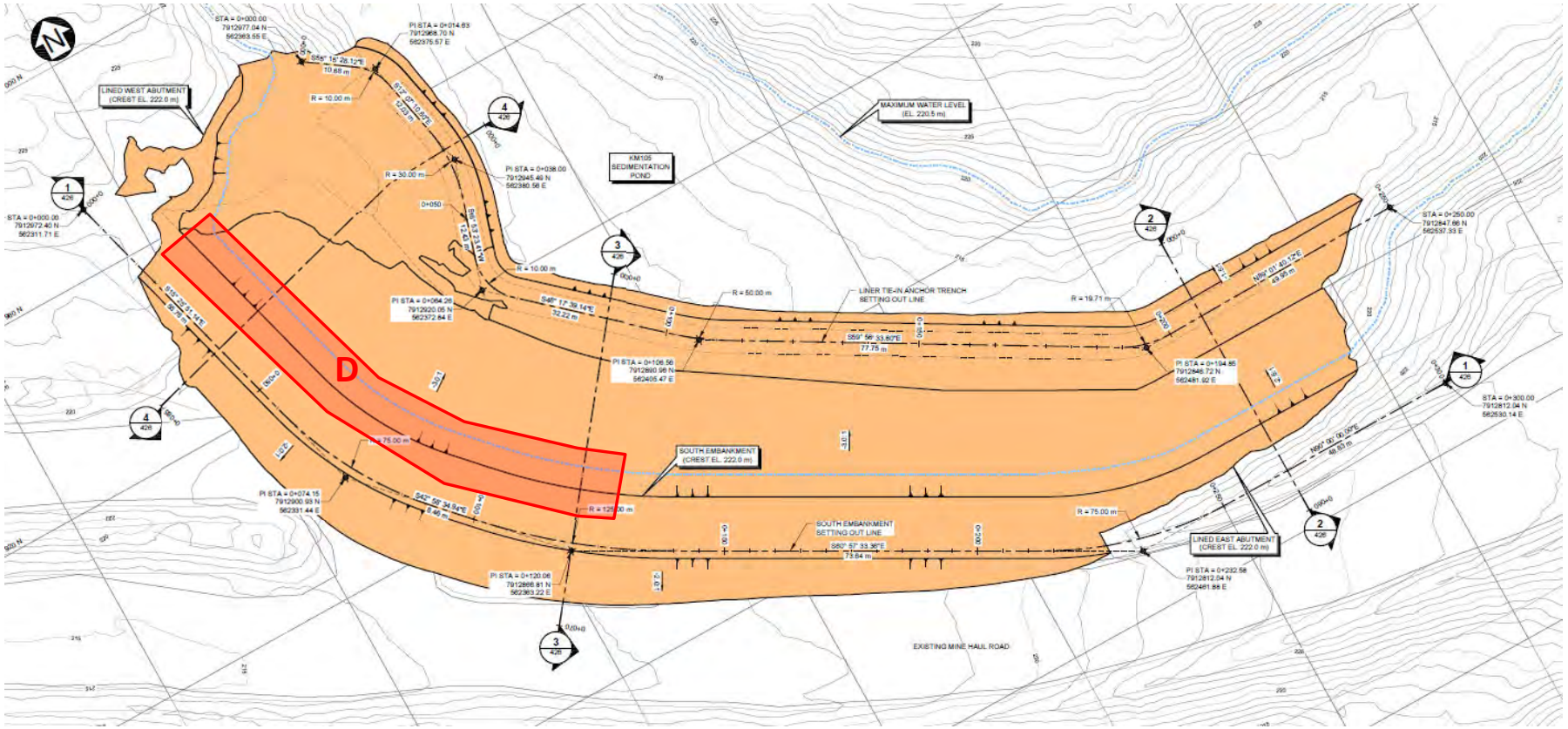
A — Area of interest/concern or recommended action

Probable alignment of Flow Through Zone

Location of proposed thermistor installation

Image Source: Knight Piésold. 2021. KM105 Sedimentation Pond Design Brief and Issued for Construction Drawings, Knight Piésold, North Bay, 28 June 2021.

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	2023 Mary River Project Site Visit #2
		KM 105 Sedimentation Pond Northwest Embankment
Mining Impact Specialists Ltd.	LGL Limited	Date: 11 Sep 2023 | Approved: LEB | FIGURE 17



LEGEND

D Area of interest/concern or recommended action

Image Source: Knight Piésold. 2021. KM105 Sedimentation Pond Design Brief and Issued for Construction Drawings, Knight Piésold, North Bay, 28 June 2021.

MINING IMPACT SPECIALISTS LTD.	LGL LIMITED	Mary River Project Site Visit #2
		KM 105 Sedimentation Pond South Embankment Detail
Mining Impact Specialists Ltd.	LGL Limited	Date: 29 Sep 2022 | Approved: LEB | FIGURE 18

March 5, 2024

Conor Goddard
Manager, Project Compliance
Qikiqtani Inuit Association
P.O. Box 1340
Iqaluit, NU X0A 0H0

RE: QIA September 2023 General Site Inspection Findings and Recommendations

Baffinland Iron Mines Corporation (Baffinland) provides the Qikiqtani Inuit Association (QIA) with the following response to a Site Inspection (Inspection) of the Mary River Mine (Project) in late September 2023. Conor Goddard and Andrew Jaworenko of QIA conducted the Inspection with technical support provided by Joe Cavallo of LGL Ltd. and Lois Boxill of MIS Ltd.

The attached Table 1 provides Baffinland's responses to the inspectors' findings and recommendations.

Should you have any additional concerns or questions regarding the attached responses, please do not hesitate to contact the undersigned at your convenience.

Regards,

Todd Swenson
Environmental Superintendent

Cc: Megan Lord-Hoyle, Lou Kamermans, Tim Sewell, Martin Beausejour, Francois Gaudreau, Connor Devereaux, Katie Babin, Allison Parker, Dale Kristoff (Baffinland)

Attachments

Table 1: Baffinland Responses to QIA September 2023 Site Inspection of the Mary River Mine

Attachment 1

Baffinland Responses to QIA September 2023 Site Inspection of the Mary River Mine

Table 1 – Baffinland Responses to QIA September 2023 Site Inspection of the Mary River Mine

Review of Spill Reports		
Location/Report Date	***Issue/Concern***	***BIM Follow-Up/Response***
Tote Road – Sep 17, 2023	Erosion reported at eight watercourse crossings. No actions required	Remedial actions implemented. No further action required.
Waste Rock Facility – Sep 3, 2023	Level of TSS exceedance was not indicated in the spill report.	The information requested was provided in the follow up report to spill 2023-466 on November 21, 2023
MRM Crusher Pad and Surface Water Management Pond 1. Aug 27, 2023 2. Nov 4, 2023	1. TSS concentration nor the portion of the collection ditch that was repaired were indicated in the spill report. 2. Transmission oil from loader – no actions required	1. The information requested was reported in the updated follow up spill report for 2023-366 as sent to Conor Goddard, Tim Soucie, Andrew Jaworenko by Todd Swenson on October 31st 2. No further action required.
MSC Lift Station – Nov 28, 2023	The source of the sewage was unknown/unclear at the time of the initial report filing.	The sewage was from the washroom facilities within the MSC building and a subsequent overfilled lift station. Additional details were provided in the follow-up Spill Report (2023-508). No further action required.
Tote Road – Aug 17, 2023	260L of diesel released from an ore haul truck. No action required	No further action required
Milne Port 1. Aug 17, 2023 2. September 8, 2023	1. 500L of waste oil observed on B1 pad from a tote within a shipping container. No action required 2. 500L of untreated sewage release at the Milne Port Waste Water Treatment Plant. No action required	1. No further action required 2. No further action required
General Comments (Page 2-3)	1. Provide TSS details in spill reports 2. Did not confirm the depth and extent of contaminated materials to be removed or where the contaminated materials were placed 3. Provide spill report number, coordinates and map of the location and area of remediation and reference locations of pre and post spill photographs.	1. Initial spill notifications are required to be submitted within 24 hours of the spill occurring thus do not generally contain lab verified TSS levels. TSS levels are included in follow up spill reports. 2. Baffinland will continue to include the information required in follow up spill reports as per Part H, Item 9 c of the Type A licence, Commercial Lease Ops guide and the Baffinland's Spill Contingency Plan (BIM 5200-PLA-0012). 3. Baffinland will continue to provide the requested information during follow-up reporting.

Site Inspection Observations (Page 3 – 5)		
Waste Rock Facility Surface Water Management Pond (WRF SWMP)	Confirm if secondary collection pond downstream of the WRF SWMP is lined.	The secondary collection pond downstream of the WRF SWMP is not lined. Baffinland can confirm, however, that based on observations there was no further migration of seepage water from this area, and that all available water was pumped back to the WRF SWMP.
Active Mining Area	1. Improved understanding of active mining area – no action required. 2. Provide mineralogical data for the pit wall and floor of the 480 bench to support characterization of ultrafine sources at the site.	1. No further action required. 2. Baffinland can provide relevant mineralogical data for the pit wall and floor of the 480 bench following confirmation from QIA regarding what specific information is requested.
KM106 Ore Storage Facility (OSF)	1. Relocation of failed ultrafines and direct new ore fines to adjacent to the southeast toe is commendable. 2. Area located west and south of the KM106 OSF SWMP should be monitored to explore if mine contact water is running subsurface through the area of natural ground.	1. Acknowledged. No further action required. 2. Baffinland has performed investigations in this area and there is no indication that the seepage observed is contact water. As part of the twice annual geotechnical inspection, in September of 2023 it was noted that "No stability or seepage related problems were observed at this pond during the September 2023 site visit." This area will continue to be inspected by a certified geotechnical inspector as required under Part D, Item 18, of the Water Licence.
KM105 Sedimentation Pond (OSF)	1. The trough along the crest and upper reaches of the upstream face of the South Embankment observed in the June 2023 inspection remains in disrepair. 2. Remediation plan proposed by Engineer-of-Record. 3. Recommend secondary capture and treatment system using geobags.	1. As recommended by the design engineer, Baffinland will continue to monitor the topography of the south embankment and implement corrective actions as per the design engineer's recommendations to prevent potential slope instability.Please see previous response to QIA's June 2023 General Site Inspection Findings, specifically, Recommendation Item QIA-1. 2. The IFU package from Tetra Tech is included as Appendix A (send via KiteWorks). This package includes the remediation plan and IFU drawings. The remediation work has commenced. 3. Baffinland is developing a contingency plan to capture any potential seepage downstream of the dam. Depending on conditions encountered, this contingency plan may include the use of a geotubes or other erosion and sediment control measures as appropriate.
Crusher Pad	Use of bespoke screens and blinds at strategic locations on crushers and conveying equipment is acknowledged and commended – no action required.	Acknowledged that the QIA Inspectors observed metal conveyor screens and rubber wind screens on transfer points and grizzly chutes on the crusher spreads during their September visit. No further action required.
Tote Road Ditches and Runoff Management Infrastructure	1. Installation of rip rap, swales and check dams at various locations are acknowledged and improvements noted.	1. Acknowledged. Baffinland will implement maintenance measures at erosion and sedimentation control structures to remove accumulated sediments as required.

	Noted that several of the locations require cleaning and annual maintenance. 2. Use of coconut coir logs at several locations are noted and recommended over the use of silt fences.	2. Acknowledged. Baffinland will prioritize coir logs use when appropriate and continue to use all available erosion and sediment control techniques.
Milne Port	1. Southwest, west and south sides of the port infrastructure indicate fine-grained transport and deposition. Purple Air devices are recommended on infrastructure that show signs of fines deposition and accumulation. 2. Thick layers of ore deposited fine grained ore were identified on the natural ground west of the ore stockpile.	1. Baffinland will continue to assess the location of Purple Air devices and assess the results and effectiveness of the program. 2. Full results of the dustfall monitoring program are reported on in the Terrestrial Environmental Annual Monitoring Report (TEAMR) including the satellite imagery analysis.
Overall TSS Management Plan	1. Acknowledge that staff will be trained to become Certified Inspectors of Sediment and Erosion Control (CISEC) 2. Use of PurpleAIr monitors encouraged – ensure elevation and orientation of all air quality monitoring devices be included in the data interpretation.	1. Acknowledged. Two (2) staff have completed training to become CISEC and additional training is ongoing 2. Baffinland will continue to use and assess the use of Purple Air monitors and ensure that elevation and orientation is recorded.
Responses to Information Requests – Page 5	1. Request mineralogical assessment information of the aggregate materials from the Q1 quarry to support an investigation into possible sources of microfine generation related to dust generation at the site and along the Tote Road. 2. This inspection is the third one attended by the Inspectors where only one water truck was reported to be in service while dust generated by OHTs using the Tote Road was observed to be consistently significant and persistent. Implementation of the Roads Management Plan to significantly overhaul the procedures that would enable more frequent and consistent use of more than one water truck to supress dust on the Tote Road. 3. Receiving and reviewing of the EOR for KM105 grout curtain.	1. Additional information on the mineralogy of the materials in the Q1 quarry was provided to QIA in correspondence dated October 31, 2023 (Swenson to Goddard). 2. The Tote Road is managed in accordance with the approved Roads Management Plan, which is reviewed and updated regularly to improve dust suppression and to address operational changes. Please see previous response to QIA's June 2023 General Site Inspection Findings, specifically, Recommendation Item QIA-1. The remedial plan is attached as Appendix A (submitted via KiteWorks)

Item No.	Project Location	Issue/Concern	QIA Requested Action	BIM Response
1	KM105 Pond (North Embankment)	June and Sept 2023 – seepage concerns	See MISL recommended actions below	Please see previous response to QIA's June 2023 General Site Inspection Findings, specifically, Recommendation Item QIA-1. The remedial plan is attached as Appendix A (submitted via KiteWorks) Baffinland is developing a plan for secondary capture and treatment any potential seepage downstream of the KM105 dam as a contingency. Depending on conditions encountered, the contingency plan may include the use of a geotube, or other water quality controls as appropriate.
2	KM105 Pond (South Embankment)	June and Sept – failure of upstream slope	See MISL recommended actions below	Please see previous response to QIA's June 2023 General Site Inspection Findings, specifically, Recommendation Item QIA-2.
3	Tote Road – throughout project area	June and Sept 2023 – excessive dust observed, lack of water trucks, vegetation effects	• Regular schedule of water truck use • Increase number of water trucks available. • Establish an early notification system for increasing dust levels • Wash heavy equipment to remove dust and sediment • Monitor dust and accumulation of dust on tundra • Monitoring of dust dispersion to identify "hot spots" and impact levels. • Monitor long-term vegetation health Evaluate use of dust suppression particularly the mixture on the effectiveness on the presence of ultrafines on the Tote Road	Please see previous response to QIA's June 2023 General Site Inspection Findings, specifically, Recommendation Item QIA-3.

			Increase the number of water trucks and the amount of water being used for dust suppression. Provide a summary of the impacts to tundra vegetation.	
4	Immediately downstream of KM105 pond	June 2023 - Fine sediments observed downstream of KM105 dam, potential altering effect on the native vegetation Sept 2023 - Geobag observed and commended.	• Remediation of dam and upstream channel to minimize the amounts of fine sediments travelling downstream. • Continue to monitor turbidity, water levels and chemical parameters in pond • Increase ESC controls if necessary	Please see previous response to QIA's June 2023 General Site Inspection Findings, specifically, Recommendation Item QIA-1 and Item No. 1 above. Routine monitoring of turbidity, water levels and other chemical parameters will continue in the area.
5	Immediately south of the mine road adjacent to the Sheardown Lake Tributary	June 2023 – potential for uncontrolled sediment release in the area. Sept 2023 – rock placed along the slope to prevent sedimentation and erosion.	ESC measures to be installed in the area to prevent sedimentation and erosion.	No further actions required.
6	Phillips Creek crossing at KM17	June 2023 – sheet piles on old bridge abutments damaged Sept 2023 – old abutments removed and rip rap placed to stabilize slopes.	• Install ESC measures • Remove old abutments • Place coarse rock to stabilize slopes	No further action required.
7	Waste Rock Facility Water Treatment Plant	June and Sept 2023 – no issues observed but understand that seepage has occurred. Sept 2023 – seepage through the treatment pond has been reported.	• Continue to monitor effluent for turbidity and other chemical parameters. • Ensure there is a contingency plan in the event of large quantities of runoff potentially exceeding the capacity of the treatment infrastructure.	Baffinland will continue to monitor the area according to all management plans and will investigate the cause of the seepage.
8	Pond KM107	June 2023 – pond used to treat TSS. Failure of slope containing ultrafine ore. Sept 2023 – gully west of the pond contained high amounts of fine sediments of unknown origin. Fines have a potential to enter Mary River downstream.	• Continue to monitor turbidity and other parameters. • Ensure a contingency plan in the event of large quantities of runoff potentially exceeding the capacity of the treatment infrastructure.	Baffinland will continue to monitor the area according to all applicable management plans.

9	SDCT-1 Tributary at KM63	In 2022 nine-spine stickleback were stranded in a pool downstream of CSP's on the west side of the road. June and Sept 2023 – erosion has occurred downstream of the 2 CSP culverts	Mitigate the perched condition of the CSP's to ensure fish passage	Baffinland has engaged the services of a third-party engineering consultant as well as a separate third party fisheries biologist to develop remedial plan for fish passage issues at this crossing, designated as BG-50. Fish passage issues continue to be a focus for Baffinland and remedial work is ongoing in addition to frequent monitoring. Any stranded fish that are observed throughout the open water season are rescued via fish salvage by trained personnel whenever required.
10	Milne Port Loading Area	Loading of ship was occurring	Minimize dust levels on loading infrastructure (conveyors chutes, etc.) to prevent dust from dispersing.	No response required
11	Ditches along mine haul road	June and Sept 2023 – informal ditches are collecting road and hillside runoff with uncontrolled flows downstream.	• Ditches should be constructed and sized appropriately with mitigation or controls to reduce flows. • Reduce TSS entering KM105 pond to reduce treatment issues in the control plant.	Please see previous response to QIA's June 2023 General Site Inspection Findings specifically Recommendation Item LGL-1.
12	KM85 Stream Crossing	June 2023– fine sediments entering the stream Sept 2023 – rock has been placed to stabilize area	• More robust ESC controls should be implemented and maintained. • Staff and a program to respond to issues in a timely and effective manner.	No response required
13	KM80 Stream Crossing	June 2023 – fine sediments entering stream due to deteriorating sediment control fencing. Sept 2023 – Coir logs and sediment control fencing installed	• More robust ESC concerns should be implemented and maintained. • Staff and a program to respond to issues in a timely and effective manner.	No response required.
14	KM105 Sedimentation Pond – North Embankment	June 2023 – water flowing from downstream toe of Northwest Embankment adjacent to North Abutment.	June 2023 – remediation plan that ensures cut-off of sedimentation pond water Sept 2023 – EOR remediation plan review Secondary containment and filtering system in place for spring 2024	Please see previous response to QIA's June 2023 General Site Inspection Findings, specifically Recommendation Item QIA-1.

15	KM105 Sedimentation Pond – Northwest Embankment	June 2023 – flushing of fine grained embankment construction materials from the lowest 1m of base along its contact with the North Abutment	June 2023 – develop a plan to seal existing flow along Northwest Embankment and North Abutment Seal flow through zone. Sept 2023 – Review EOR remediation plan for remediation of dam Secondary containment and filtering system in place for spring 2024	Please see previous response to QIA's June 2023 General Site Inspection Findings, specifically, Recommendation Item QIA-1 and Item No. 1 above. Routine monitoring of turbidity, water levels and other chemical parameters will continue in the area.
16	KM105 Sedimentation Pond – Northwest Embankment	June 2023 – possible melting of upper reaches of permafrost and creation of a progressive thawing front between North Abutment base and Northwest Embankment	June 2023 – provide a map of thermistor locations and depths for DT2040,-02660, DT2040-02871, DT2040-02873 and DT2040-02876. • Install additional thermistors at depths of top of permafrost horizon beneath the base of the Northwest Embankment • Based on temperature measurements determine if mitigative actions are necessary to avoid further or accelerated thawing of permafrost and if melting permafrost may impact structural integrity of Northwest Embankment's foundation and superstructure	An instrumentation assessment is being completed by the EOR and any deficiencies will be addressed.
17	KM105 Sedimentation Pond – Northwest Embankment	Potential for possible water ingress along the upstream toe of the Northwest Embankment.	June 2023 - Ensure that remediation plan for the Northwest Embankment extends upstream of the toe of this embankment to avoid water ingress into the dam foundation Sept 2023 – EOR remediation plan review Ensure secondary containment and filtering system as a contingency	Please see previous response to QIA's June 2023 General Site Inspection Findings, specifically, Recommendation Item QIA-1 and Item No. 1 above Routine monitoring of turbidity, water levels and other chemical parameters will continue in the area.

18	KM105 Sedimentation Pond – South Embankment	June 2023 – extensive slumping of upper third of upstream slope and no evidence of geotextile on top of the HDPE liner Sept 2023 – slumped materials from the upstream crest edge and uppermost reaches of the upstream slope of the south embankment remain in the same condition as June 2023. Erosion features in slumped materials with the geomembrane exposed and creating a trough for snow and ice to accumulate.	June 2023 – ensure remediation plan includes installation of geotextile on top of geomembrance and anchored into a trench beneath the crest Crest and upstream slope embankment materials must be placed and adequately compacted to stabilize the crest to provide trafficable surface. Sept 2023 – remediate previous damage to avoid further degradation or erosion of embankment materials	Please see previous response to QIA's June 2023 General Site Inspection Findings, specifically, Recommendation Item QIA-2.
19	Tote Road (KM105 through KM17)	Sept 2023 – dust and fine-grained sediment on surfaces of rip rap in armoured swales, drainage channels and ditches.	Sept 2023 – removal of sediment on armoured surfaces as part of an annual sediment control structure maintenance plan. Remove debris and sediment accumulated in upstream side of installed coir logs	Baffinland will implement maintenance measures at erosion and sedimentation control structures to remove accumulated dust and sediments as required.
20	Tote Road (KM105 through KM17)	Sept 2023 – silt fences in various states of disrepair used independently or with other sediment control structures	Sept 2023 – replace all silt fences with coir logs. Use coconut coir logs in combination with maintained sediment control structures	Baffinland will implement maintenance measures at erosion and sedimentation control structures to remove accumulated dust and sediments as required. Baffinland will prioritize coir logs use when appropriate and continue to use all available erosion and sediment control techniques.
21	Tote Road (KM7)	Sept 2023 – extensive erosion of surface materials leading to undermining ground stability at staging area where light trucks and other vehicles are stored. Ground beneath has been completely washed away creating unsafe conditions and potential loss of vehicle into downstream ravine that appears to be deepening.	Relocate vehicles from within the limits of the developing erosion gulley. Design and install properly armoured storm management channel to mitigate further development of existing gulley.	Baffinland will investigate options to mitigate erosion of the storm management channel and ensure safe conditions in the area.
22	Tote Road (entire alignment)	Sept 2023 – quarried rock from Q1 quarry could be a source of ultrafines contributing to dust generated on Tote Road. Only one truck reported to be operational	Sept 2023 – provide mineralogical data to QIA for ore and aggregates used to build the Tote Road. It will be used to assess and identify sources of ultra-fines and	Additional information on the mineralogy of the materials in the Q1 quarry was provided to QIA in correspondence dated October 31, 2023 (Swenson to Goddard).

			support identification of possible ways to improve dust management at the site. Develop a program to demonstrate how measures included in the Tote Road Management Plan is effectively managing dust along the Tote Road.	The Tote Road is managed in accordance with the approved Roads Management Plan, which is reviewed and updated regularly to address operational changes. Additional information on dust suppression trials was provided to QIA in correspondence dated October 31, 2023 (Swenson to Goddard).
23	Milne Port loading infrastructure	Sept 2023 – significant fine-grained ore observed caking the west, southwest and south faces of ship loading equipment and covered structures downwind of ore stockpiles	Sept 2023 – install air quality monitoring devices similar to PurpleAir units being trialed to collect data about wind direction, frequency and amount of fines being transported from the ore stockpiles. Ensure directional information is recorded for all air quality monitoring devices	Baffinland has been utilizing PurpleAir monitoring devices in the area of the ore stockpiles. Other techniques and products for dust suppression at the ore stockpiles are also being investigated.

Appendix A

IFU Remediation Package for the 105 Dam
(sent separately via KiteWorks)

TETRA TECH

TECHNICAL MEMO

ISSUED FOR USE

To:	Jim Patterson	**Date:**	February 6, 2024
c:	Baruck Wile, Rudolf Dietrich, Emmanuel Ocran, Abid Najey	**Memo No.:**	
From:	Charlie Harrison	**File:**	704-ENG.EARC03209-10
Subject:	Revised the Issued for Construction (IFC) Drawings for the KM105 Sedimentation Pond Grout Curtain		

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) has revised the issued for construction (IFC) drawings for the KM105 Sedimentation Pond grout curtain, as requested by Baffinland Iron Mines Corporation (Baffinland). The scope of work for revising the IFC drawings is summarized in Tetra Tech's change order dated January 22, 2024. Tetra received authorization to proceed with the revision of the IFC drawings from Baffinland, via email, on January 23, 2024. The revised IFC drawings, indicated as Revision 1 on the drawings, are attached.

2.0 CHANGES TO IFC DRAWINGS

The changes to the IFC drawings are summarized as follows:

1. Revised alignment for the grout curtain: the grout curtain was shifted to the east by about 25 m to allow for the grout holes to be advanced through the existing geomembrane liner. This will accommodate a direct connection between the top of the grout curtain and the existing liner system for the pond.

2. Revised alignment of the temporary platform: the temporary platform was realigned to match the revised alignment of the grout curtain.

3. Temporary platform fill material: the central core material was changed to 19 mm minus crushed sand and gravel from 50 mm crushed sand and gravel to accommodate the change in drilling methodology, as recommended by Keller.

The changes are shown on the attached IFC drawings.

3.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Baffinland Iron Mines Corporation and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Baffinland Iron Mines Corporation, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

Tetra Tech Canada Inc.
14940 - 123 Avenue
Edmonton, AB T5V 1B4 CANADA
Tel 780.451.2121 Fax 780.454.5688

4.0 CLOSURE

We trust this technical memo meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.

704-ENG.EARC03209-10
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704-ENG.EARC03209-10

Prepared by:
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/jf

Enclosure: Limitations on Use of this Document
Revised KM105 Sedimentation Grout Curtain IFC Drawings

PERMIT TO PRACTICE
TETRA TECH CANADA INC.

Signature _____

Date _____

PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

LIMITATIONS ON USE OF THIS DOCUMENT

GEOTECHNICAL

1.1 USE OF DOCUMENT AND OWNERSHIP

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Both electronic file and/or hard copy versions of TETRA TECH’s Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH’s Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client’s current or future software and hardware systems.

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Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by persons other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary investigation and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, TETRA TECH has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues associated with development on the subject site.

1.8 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems and methods employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. TETRA TECH does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

1.9 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

1.10 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historic environment. TETRA TECH does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional investigation and review may be necessary.

1.11 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

1.12 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

1.13 INFLUENCE OF CONSTRUCTION ACTIVITY

There is a direct correlation between construction activity and structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques are known.

1.14 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, as well as the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

1.15 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems which will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

1.16 BEARING CAPACITY

Design bearing capacities, loads and allowable stresses quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition assumed. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions assumed in this report in fact exist at the site.

1.17 SAMPLES

TETRA TECH will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

BAFFINLAND IRON MINES CORPORATION

KM105 SEDIMENTATION POND
---- GROUT CURTAIN PROJECT

KEY PLAN
SCALE: NTS

SHEET LIST INDEX	
Number	**Title**
C001	Cover Page and Drawing List
C002	General Notes
C011	General Layout Plan View
C012	Work Area Layout Plan View
C021	Geological Boreholes Plan View
C022	Geological Profile Section View - Stick Logs
C023	Geological Profile Section View - Stratigraphy
C031	Grout Holes Layout Plan View
C032	Grout Holes Layout Profile View
C033	Primary Grout Holes Layout Plan and Profile View
C034	Secondary Grout Holes Layout Plan and Profile View
C035	Tertiary Grout Holes Layout Plan and Profile View
C041	Temporary Work Platform Layout Plan View
C042	Temporary Work Platform Profiles View
C043	Temporary Work Platform Sections and Detail View
C044	Grout Holes Number Layout Plan View
C045	Coordination of Grout Holes Number List
C046	Temporary Work Platform 3D View A and B

TETRA TECH

Issued for Construction

FEBRUARY 06, 2024

1. GEOLOGY

1.1. THE SUBSURFACE GROUND CONDITIONS ENCOUNTERED ALONG THE GROUT CURRENT ALIGNMENT ARE SHOWN ON THE DRAWINGS. THE DRAWINGS REPRESENT THE INTERPRETED GROUND CONDITIONS BUT COULD DIFFER FROM THE GROUND CONDITIONS ENCOUNTERED WHILE ADVANCING THE GROUT HOLES.

1.2. THE SUBSURFACE CONDITIONS SHOWN ON THE DRAWINGS SHOULD BE USED AS A GUIDE ONLY. ACTUAL GROUND CONDITIONS ENCOUNTERED DURING THE ADVANCEMENT OF THE GROUT HOLES WILL GOVERN THE SELECTION OF GROUT MIXES.

2. TEMPORARY PLATFORM FILL

2.1. MATERIAL PLACED ALONG THE ALIGNMENT OF THE GROUT CURTAIN SHALL HAVE A NOMINAL GRAIN SIZE SMALLER THAN ROQ.

2.1.1. MATERIAL PLACED ON EITHER SIDE OF THE GROUT CURTAIN ALIGNMENT SHALL CONSIST OF ROQ.

2.1.2. MATERIAL SHALL BE NOMINALLY COMPACTED USING THE AVAILABLE CONSTRUCTION EQUIPMENT ON SITE.

3. GROUT

3.1. ACCEPTANCE OF MIX DESIGN

3.1.1. THE GEOTECHNICAL INVESTIGATION INDICATES THAT THE AMBIENT GROUND TEMPERATURE VARIES FROM -4.5 DEGREE C TO -8 DEGREES C. THE GROUT MIX DESIGN MUST CONSIDER THE LOW-TEMPERATURE CONDITIONS IN ORDER TO PERMIT PROPER SETTING AND CURING OF THE CEMENTITIOUS MATERIALS AFTER INJECTION, PARTICULARLY IN SANDY SOILS.

3.1.2. THE CONTRACTOR SHALL PERFORM BENCH SCALE TESTING TO CONFIRM THAT THE PROPOSED MIX DESIGN CAN MEET THE REQUIRED VISCOSITY AND INITIAL SETTING TIME, AND THE MIX DESIGN SHALL BE ADJUSTED TO ACHIEVE THE REQUIRED VISCOSITY AND INITIAL SETTING TIME. THE CONTRACTOR WILL USE THIS INFORMATION TO MODIFY THE MIXING AND INJECTION PROCEDURES TO ACHIEVE THE DESIRED SET TIME MEASURED FROM THE POINT OF INJECTION.

3.1.3. THE GROUT MIX SHALL BE BASED ON THE MATERIALS AVAILABLE ON SITE.

3.1.4. THE GROUT MIX DESIGNS SHALL BE ADJUSTED BASED ON THE CONDITIONS ENCOUNTERED DURING GROUTING IN COLLABORATION WITH THE ENGINEER, AS NEEDED, TO PRODUCE THE GROUT MIXES REQUIRED FOR THE CONSTRUCTION OF THE GROUT CURTAIN.

3.1.5. THE SUBSURFACE CONDITIONS MAY CONSISTS OF ACTIVE SEEPAGE AREA. IF ACTIVE SEEPAGE AREA IS ENCOUNTERED DURING DRILLING AND GROUTING, THE MIX DESIGN SHALL INCORPORATE APPROPRIATE ANTI-WASHOUT AGENT.

3.2. TESTING OF GROUT MIXES

3.2.1. GROUT PRODUCTS WILL BE TESTED AS PER TABLE 5.3.1-1 DURING CONSTRUCTION TO CONFIRM ITS SUITABILITY FOR THE INTENDED.

4. SETTING OUT OF GROUT HOLES

4.1. ALL COORDINATES ARE IN UTM NAD83 ZONE 17.

4.2. SURVEY CONTROL

4.2.1. SURVEY CONTROL TO BE PROVIDED FOR ALL ASPECTS OF GROUT CURTAIN CONSTRUCTION.

4.2.2. ALL GROUT HOLES TO BE LOCATED IN THE FIELD BY THE SURVEYOR.

4.2.3. INCLINATION OF ALL GROUT HOLES TO BE CONFIRMED USING A DOWNHOLE ORIENTATION TOOL.

4.3. SURFACE GRADING

4.3.1. ALL CONSTRUCTION WORK AREAS ARE TO BE GRADED SUCH THAT NO PONDING OF WATER OCCURS. SUBSURFACE DRAINAGE SHALL BE SUPPLIED FOR LAYDOWNS WHERE SITE GRADING IS NOT SUITABLE TO PREVENT THE PONDING OF WATER.

4.4. CONTAINMENT FOR CONSTRUCTION MATERIALS STORAGE

4.4.1. LAYDOWNS THAT ARE DESIGNATED FOR THE STORAGE OF CONSTRUCTION MATERIALS SHALL BE EQUIPPED WITH SUITABLE CONTAINMENT WORKS TO CONTAIN SPILLS.

4.4.2. CONTAINMENT SYSTEMS SHALL MEET THE REQUIREMENTS OF THE ENVIRONMENTAL PERMITS FOR THE PROJECT.

4.5. SEQUENCE OF GROUTING

4.5.1. THE SECONDARY AND TERTIARY GROUT HOLES SHALL NOT BE DRILLED UNTIL THE COMPLETION OF DRILLING AND GROUTING OF PRIMARY HOLE.

TABLE 5.3.1-1 MINIMUM REQUIRED QUALITY TESTING FOR TESTING FOR GROUT

MATERIAL	TEST	FREQUENCY	STANDARD
LOCATION AND EXTENTS	GROUT HOLE AS-BUILT COLLAR SURVEY	EACH GROUT HOLE	N/A
HOLE ALIGNMENT	HOLE DEVIATION SURVEY	APPROXIMATELY EVERY 5 m INTERVAL ALONG THE LENGTH OF THE BOREHOLE; TO BE COMPLETED USING AN ACOUSTIC TELEVIEWER	N/A
EQUIPMENT CALIBRATION CHECKS	PRESSURE TRANSDUCER AND GAUGES		
	FLOW METERS		N/A
	MUD BALANCE		N/A
	DIGITAL THERMOMETERS		N/A
APPARENT VISCOSITY	MARSH FUNNEL	1 AT THE INITIATION OF INJECTION OF EACH GROUT STAGE AND AT EVERY CHANGE OF MIX TYPE	ASTM D6910
SPECIFIC GRAVITY	MUD BALANCE		ASTM D4380
GROUT MIX TEMPERATURE	DIGITAL THERMOMETERS		N/A
BLEED	MEASURED OVER 2 HOUR PERIOD AS CLEAR WATER AT THE TOP OF A 500 mL GRADUATED CYLINDER	1 EVERY SHIFT, PER GROUT PLANT, FOR EACH MIX TYPE INJECTED	ASTM C940
MIX WATER, AMBIENT, AND CEMENT TEMPERATURE	DIGITAL THERMOMETERS	2 EVERY SHIFT, PER GROUT PLANT	ASTM D2573
GELATION TIME	VANE SHEAR	1 PER PROPOSED GROUT MIX TYPE DURING INITIAL FULL SCALE MIX TESTING OR WHEN ADJUSTMENTS ARE MADE TO THE MIX DESIGNS.	N/A
SET TIME	VICAT NEEDLE	1 PER PROPOSED GROUT MIX TYPE DURING INITIAL FULL SCALE MIX TESTING OR WHEN ADJUSTMENTS ARE MADE TO THE MIX DESIGNS.	ASTM C191
WATER PRESSURE TESTING: FLOW RATE, PRESSURE, VOLUME, AND LUGEON VALUE MONITORING	REAL TIME MONITORING AND DATA ACQUISITION	CONTINUOUS VISUAL MONITORING DURING WATER PRESSURE TESTING; WATER PRESSURE BEFORE GROUTING EACH GROUT HOLE INTERVAL	N/A
GROUT INJECTION: FLOW RATE, PRESSURE, VOLUME, AND GROUT LUGEON VALUE MONITORING	REAL TIME MONITORING AND DATA ACQUISITION	CONTINUOUS VISUAL MONITORING DURING GROUT INJECTION	N/A

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PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT
BAFFINLAND IRON MINES CORPORATION

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

GENERAL NOTES

TETRA TECH

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1

OFFICE: EDM
DATE: FEBRUARY 06, 2024

C002

562100.0000 562150.0000 562200.0000 562250.0000 562300.0000 562350.0000 562400.0000 562450.0000

7913200.0000 7913150.0000 7913100.0000 7913050.0000

BH23-04 BH23-02 BH23-03 BH23-01

220.00 230.00 240.00

LEGEND:

- PROJECT BONNDARY
- PROJECT AREA
- AS-BUILT GEOMEMBRANE LINER

0 50m

Scale: 1:1,000 @ 11"x17"

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PERMIT TO PRACTICE
TETRA TECH CANADA INC.
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Date _____
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BAFFINLAND IRON MINES CORPORATION

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

WORK AREA LAYOUT PLAN VIEW

TETRA TECH

PROJECT NO.	DWN	CKD	REV	
ENG. EARC03209-10	RC	CH	1	C011
OFFICE	DATE			
EDM	FEBRUARY 06, 2024			

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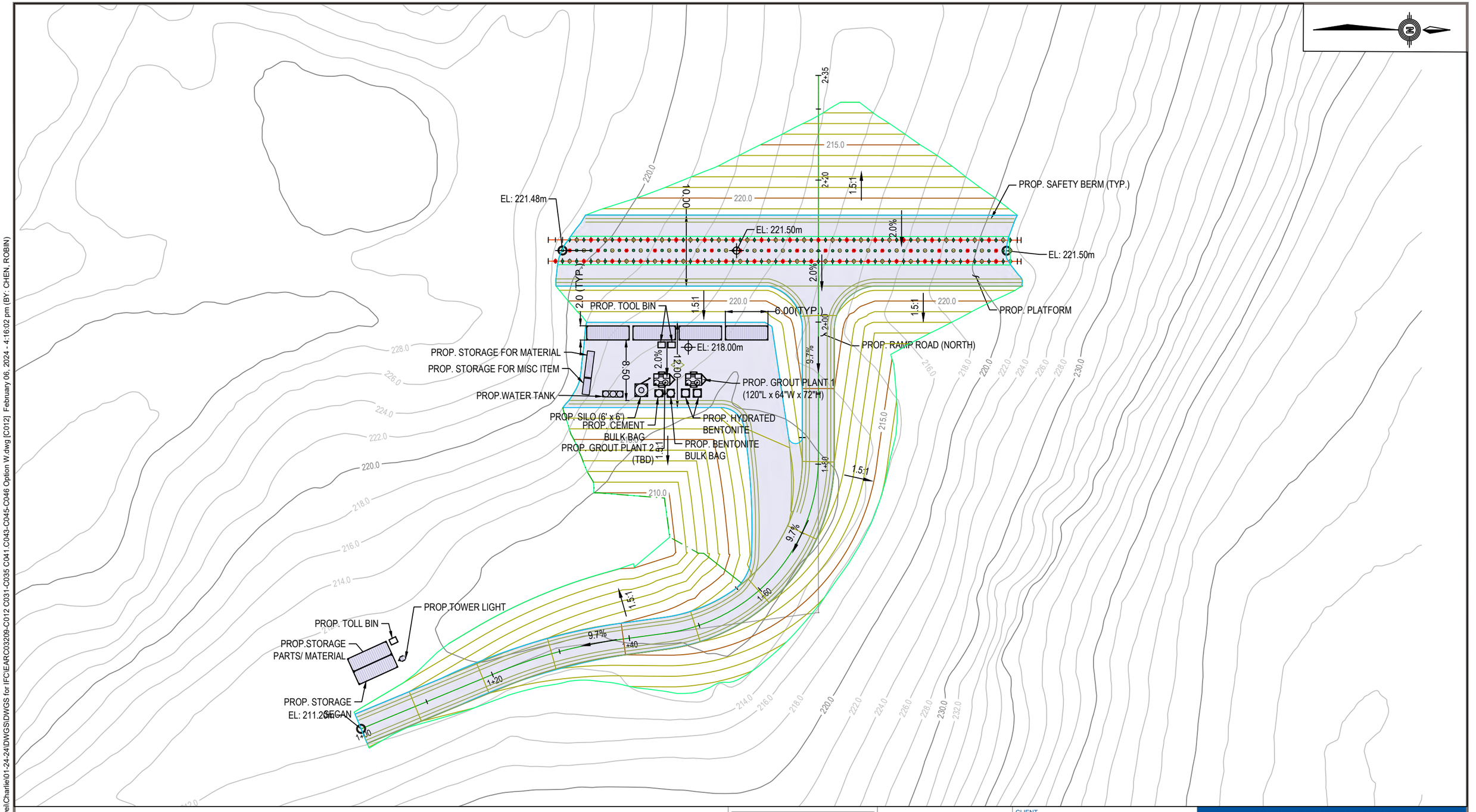

LEGEND:

- (S) - GROUT S..
- (P) - GROUT P..
- (T) - GROUT T..

0 25m

Scale: 1:500 @ 11"x17"

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
7. THE RAMP MUST BE MAINTAINED CLEAR OF SNOW, AND REGULARLY SANDED FOR TRACTION CONTROL.
8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

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CLIENT

BAFFINLAND IRON MINES CORPORATION

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

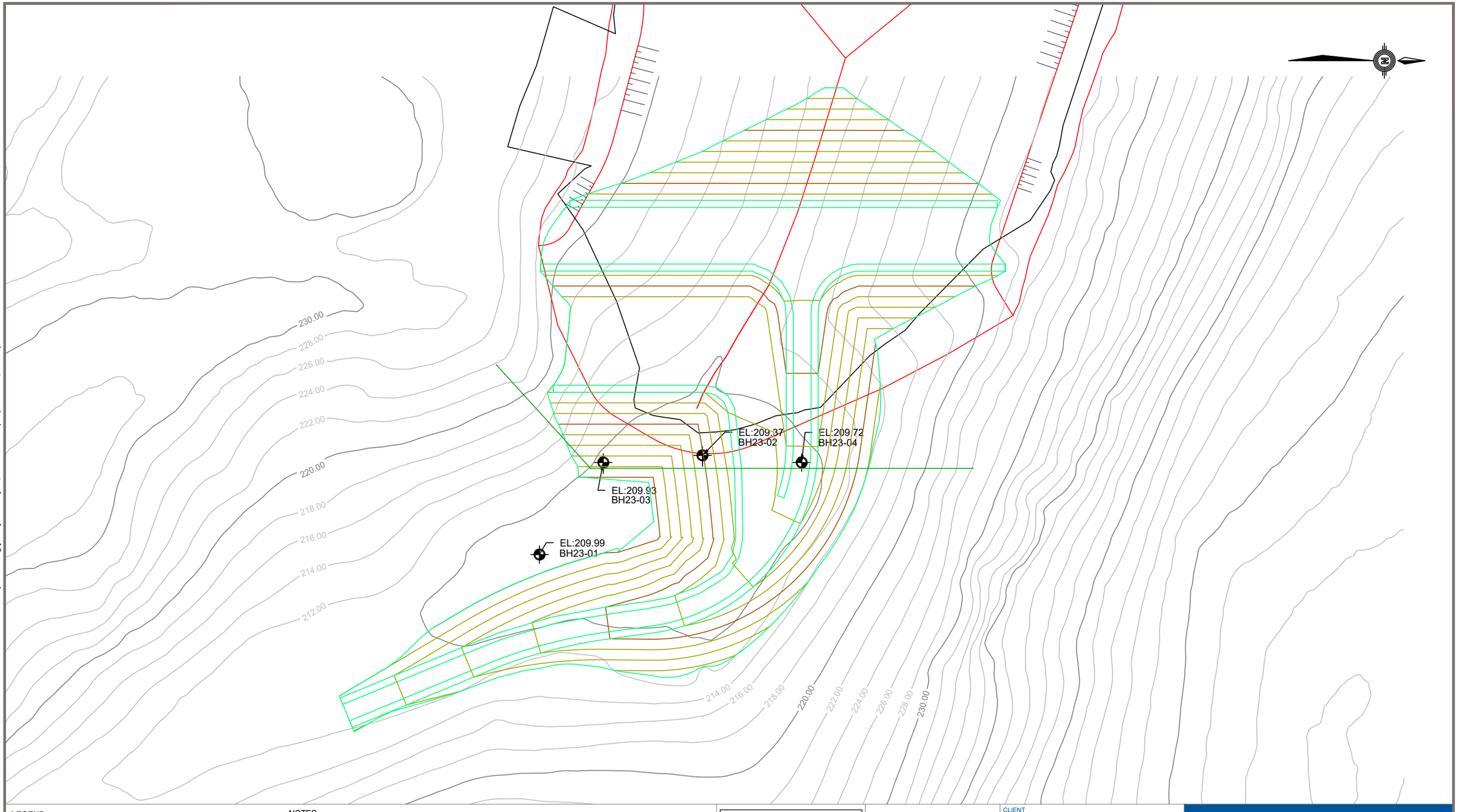
WORK AREA LAYOUT PLAN VIEW

TETRA TECH

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE	DATE		
EDM	FEBRUARY 06, 2024		

C012

C:\Users\robin.chen\Documents\Hongwei\Charlie\01-24-24\DWGS\DWGS for IFC\EARC03209-C012 C031-C035 C041 C043-C045-C046 Option W.dwg [C012] February 06, 2024 - 4:16:02 pm (BY: CHEN, ROBIN)



LEGEND:

- BOREHOLE
- AS-BUILT GEOMEMBRANE LINER
- GROUT S..
- GROUT P..
- GROUT T..

0 15m

Scale: 1:300 @ 11"x17"

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
7. THE RAMP MUST BE MAINTAINED CLEAR OF SNOW, AND REGULARLY SANDED FOR TRACTION CONTROL.
8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.

Signature _____

Date _____

PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT

BAFFINLAND IRON MINES CORPORATION

GEOLOGICAL BOREHOLE PLAN VIEW

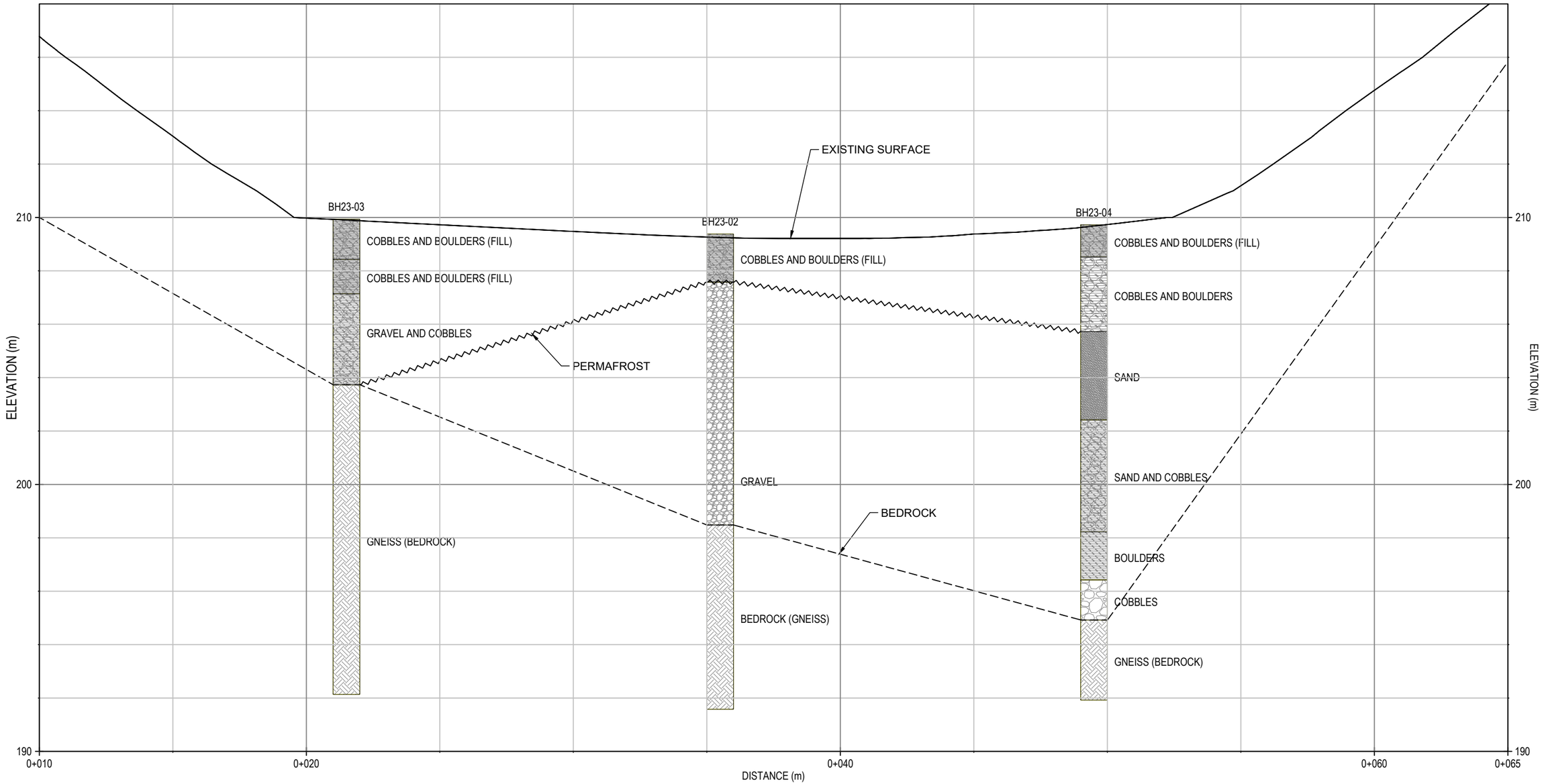
TETRA TECH

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1

OFFICE	DATE
EDM	FEBRUARY 06, 2024

C021

C:\Users\robin.chen\Documents\Hongwei\Charlie\01-24-24\DWGS\DWGS for IFC\EARC03209-C021-23 Option W.dwg [C021] February 06, 2024 - 4:16:08 pm (BY: CHEN, ROBIN)



A C021 BOREHOLE PROFILE
SCALE: 1:150

LEGEND:

- Ⓢ - GROUT S..
- Ⓟ - GROUT P..
- Ⓣ - GROUT T..
- - COBBLES AND BOULDERS
- - ORGANIC GRAVEL
- - SAND
- - GNEISS
- - SAND AND GRAVEL
- - COBBLY SAND
- - BOULDERS
- - COBBLES
- - PERMAFROST
- - BEDROCK

ISSUED FOR CONSTRUCTION

0 5m
Scale: 1:150 @ 11"x17"

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

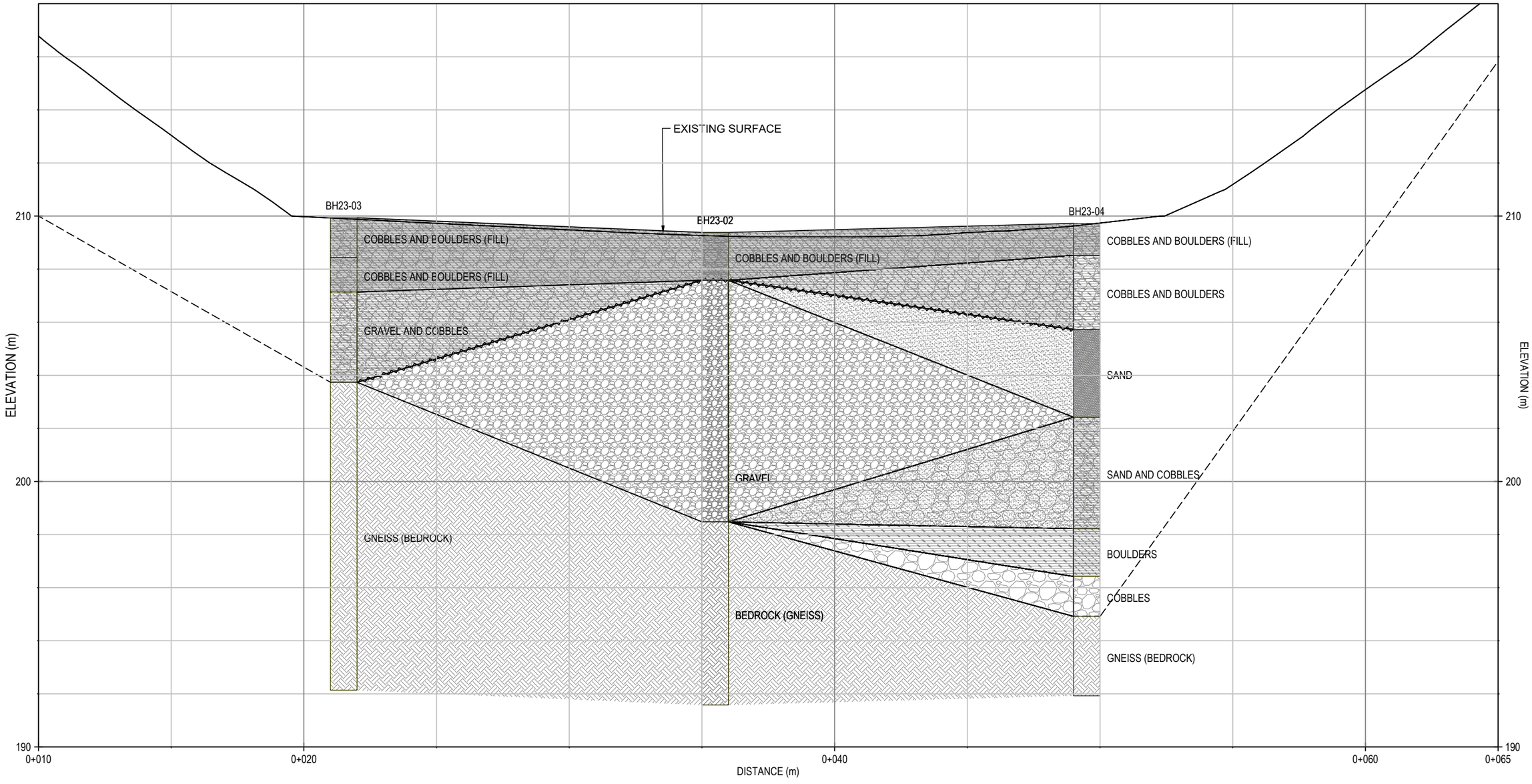
CLIENT
BAFFINLAND IRON MINES CORPORATION

TETRA TECH

GEOLOGICAL PROFILE SECTION VIEW - STICK LOGS

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	0
OFFICE	DATE		
EDM	DECEMBER 22, 2023		

C022



B / C021 BOREHOLE PROFILE
SCALE: 1:150

LEGEND:

- Ⓢ - GROUT S..
- Ⓟ - GROUT P..
- Ⓣ - GROUT T..
- - COBBLES AND BOULDERS
- - ORGANIC GRAVEL
- - SAND
- - GNEISS
- - SAND AND GRAVEL
- - COBBLY SAND
- - BOULDERS
- - COBBLES
- - PERMAFROST
- - BEDROCK

ISSUED FOR CONSTRUCTION

0 5m
Scale: 1:150 @ 11"x17"

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT
BAFFINLAND IRON MINES CORPORATION

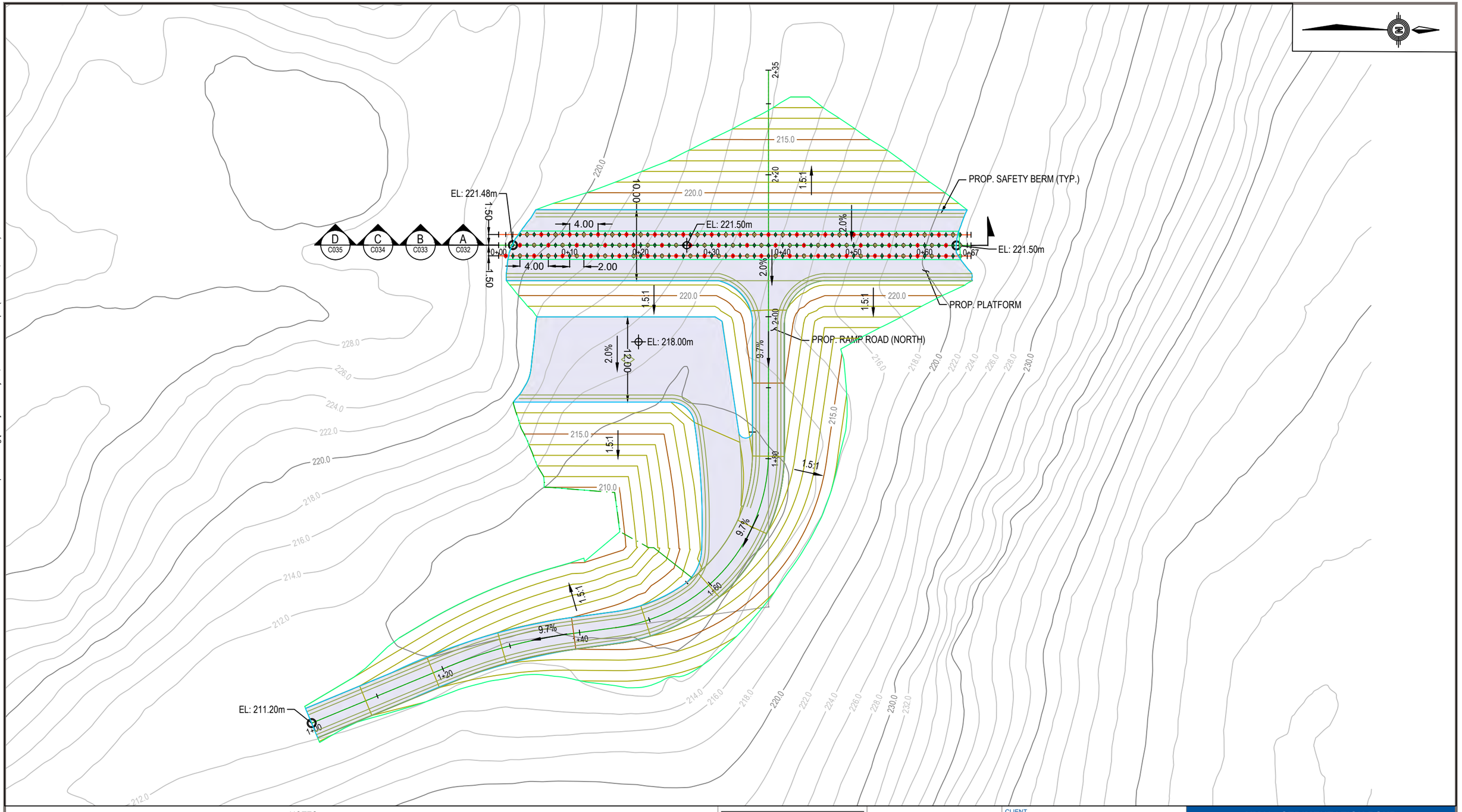
TETRA TECH

GEOLOGICAL PROFILE SECTION VIEW - STRATIGRAPHY

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	0
OFFICE	DATE		
EDM	DECEMBER 22, 2023		

C023

C:\Users\robin.chen\Documents\Hongwei\Charlie\01-24-24\DWGS\DWGS for IFC\EARC03209-C021-23 Option W.dwg [C023] February 06, 2024 - 4:16:16 pm (BY: CHEN, ROBIN)



LEGEND:

- (S) - GROUT S..
- (P) - GROUT P..
- (T) - GROUT T..

0 25m

Scale: 1:500 @ 11"x17"

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
7. THE RAMP MUST BE MAINTAINED CLEAR OF SNOW, AND REGULARLY SANDED FOR TRACTION CONTROL.
8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT

BAFFINLAND IRON MINES CORPORATION

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

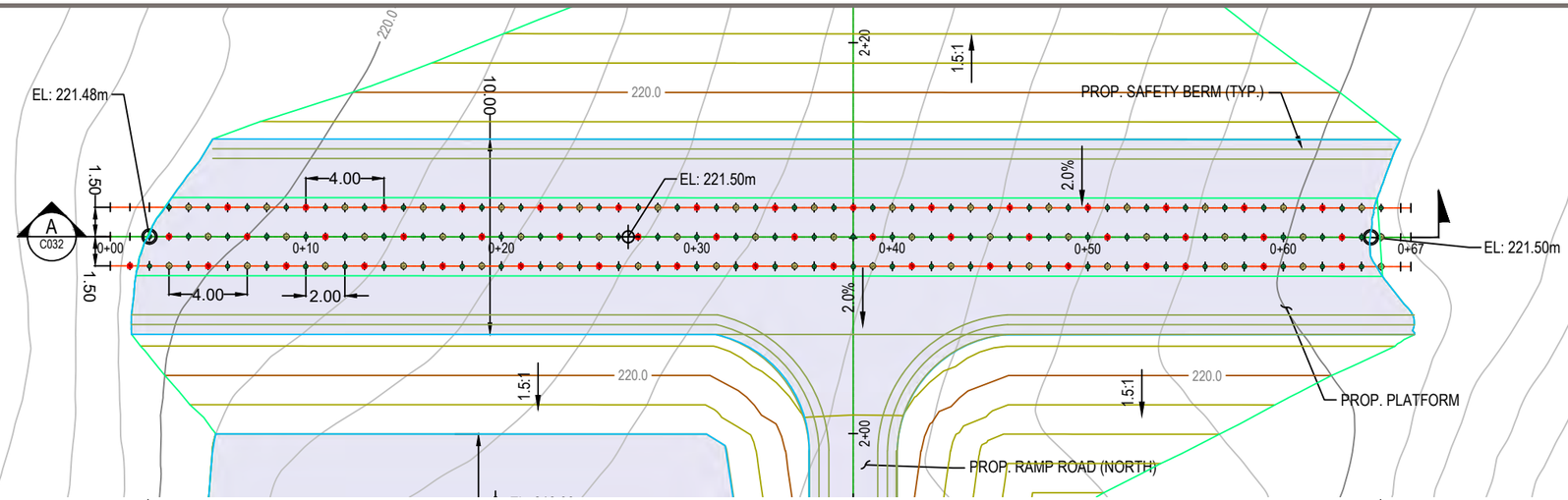
GROUT HOLES LAYOUT PLAN VIEW

TETRA TECH

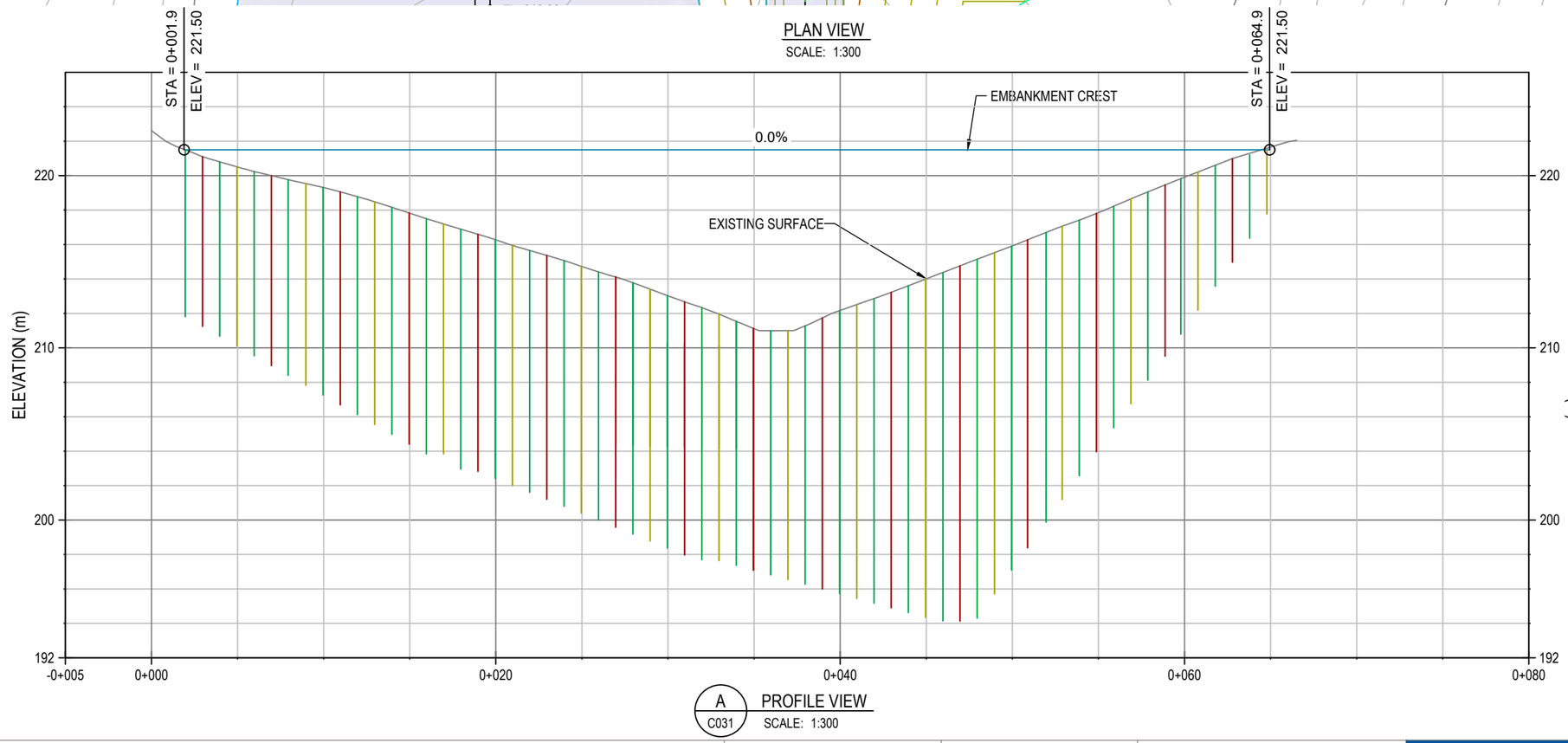
PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE	DATE		
EDM	FEBRUARY 06, 2024		

C031

C:\Users\robin.chen\Documents\Hongwei\Charlie\01-24-241DWGS\DWGS for IFC\EARC03209-C012 C031-C035 C041 C043-C045-C046 Option W.dwg [C031] February 06, 2024 - 4:16:26 pm (BY: CHEN, ROBIN)



PLAN VIEW
SCALE: 1:300



A C031 PROFILE VIEW
SCALE: 1:300

LEGEND:

- (S) - GROUT S.. ---------- - BEDROCK SURFACE
- (P) - GROUT P.. ——— - EXISTING SURFACE
- (T) - GROUT T.. ——— - EMBANKMENT CREST
- ——— - PRIMARY
- ——— - SECONDARY
- ——— - TERTIARY
- ——— - TEMPORARY PLATFORMS

0 15m

Scale: 1:300 @ 11"x17"

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
7. THE RAMP MUST BE MAINTAINED CLEAR OF SNOW, AND REGULARLY SANDED FOR TRACTION CONTROL.
8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT

BAFFINLAND IRON MINES CORPORATION

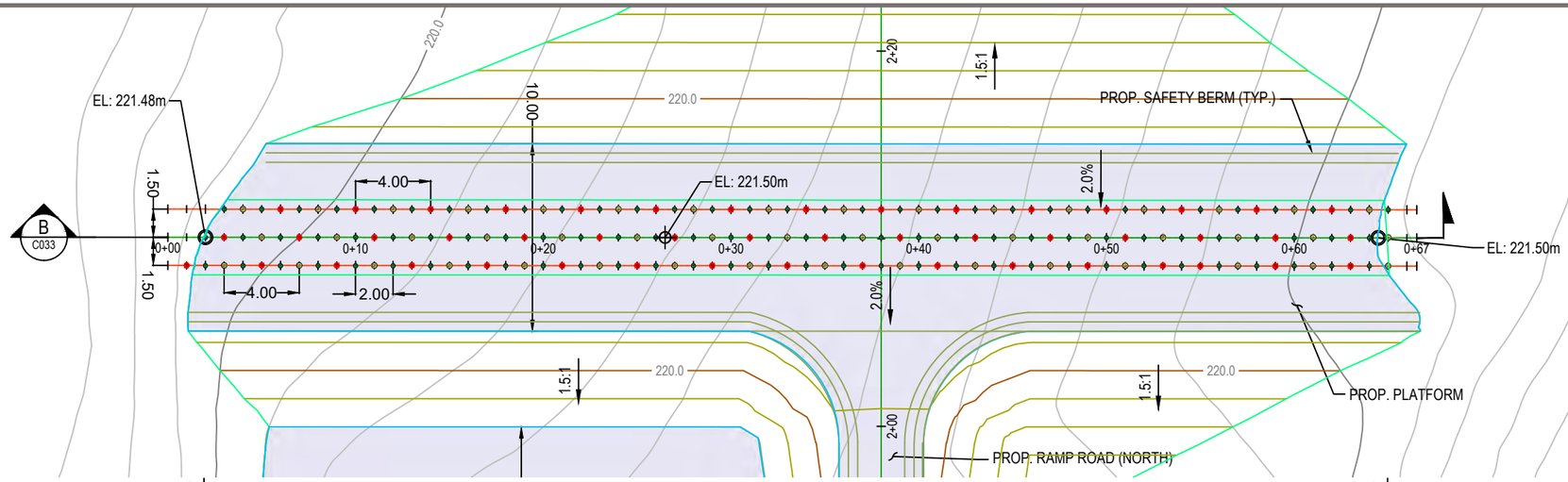
KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

GROUT HOLES LAYOUT PLAN AND PROFILE VIEW

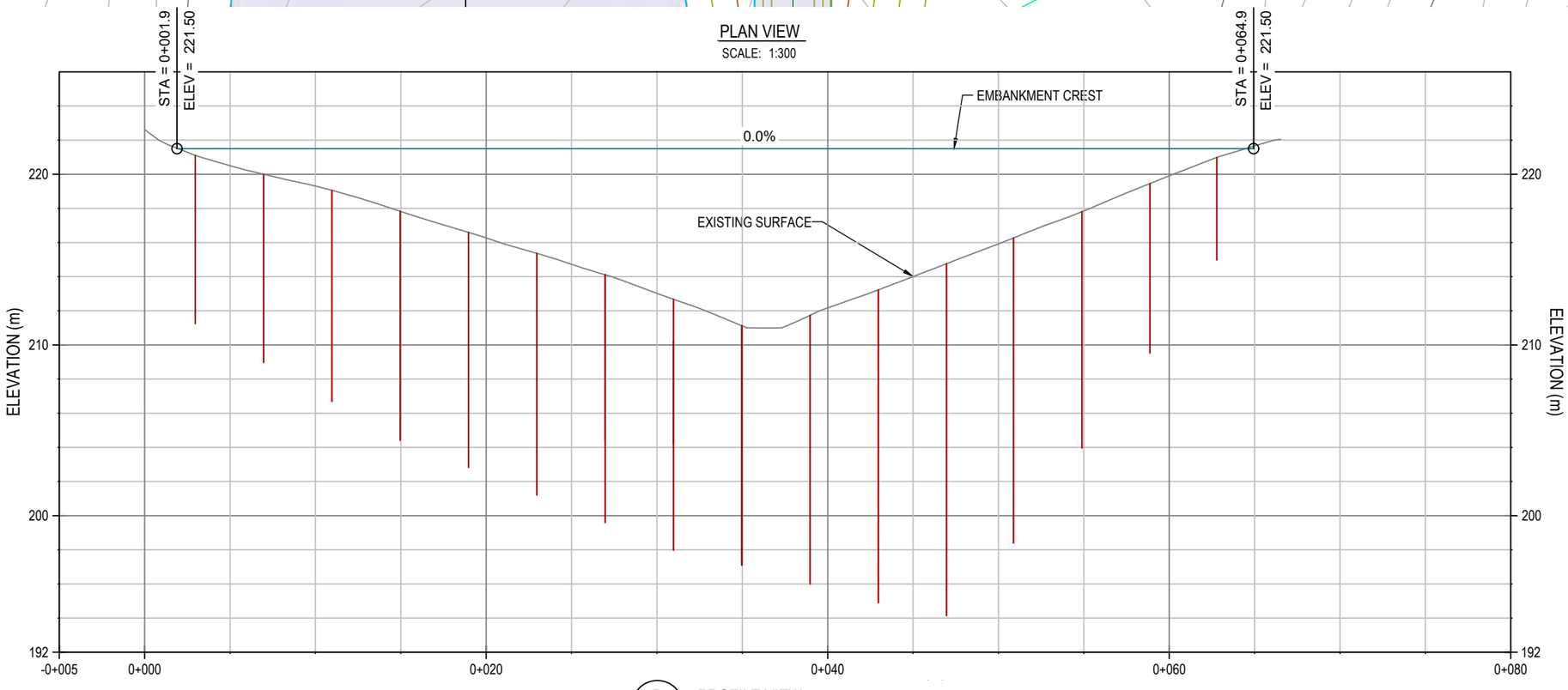
TETRA TECH

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE	DATE		
EDM	FEBRUARY 06, 2024		

C032



PLAN VIEW
SCALE: 1:300



B C031 PROFILE VIEW
SCALE: 1:300

LEGEND:

- (S) - GROUT S..
- (P) - GROUT P..
- (T) - GROUT T..
- BEDROCK SURFACE
- EXISTING SURFACE
- EMBANKMENT CREST
- PRIMARY
- SECONDARY
- TERTIARY
- TEMPORARY PLATFORMS

0 15m

Scale: 1:300 @ 11"x17"

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
7. THE RAMP MUST BE MAINTAINED CLEAR OF SNOW, AND REGULARLY SANDED FOR TRACTION CONTROL.
8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT

BAFFINLAND IRON MINES CORPORATION

TETRA TECH

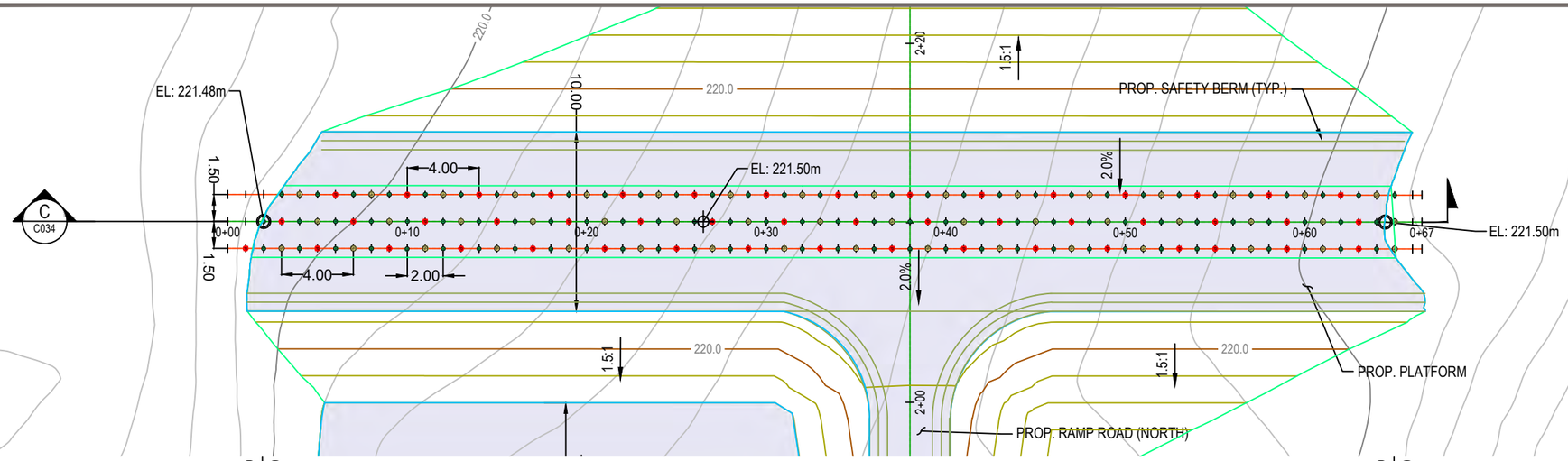
KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

PRIMARY GROUT HOLES LAYOUT PLAN AND PROFILE VIEW

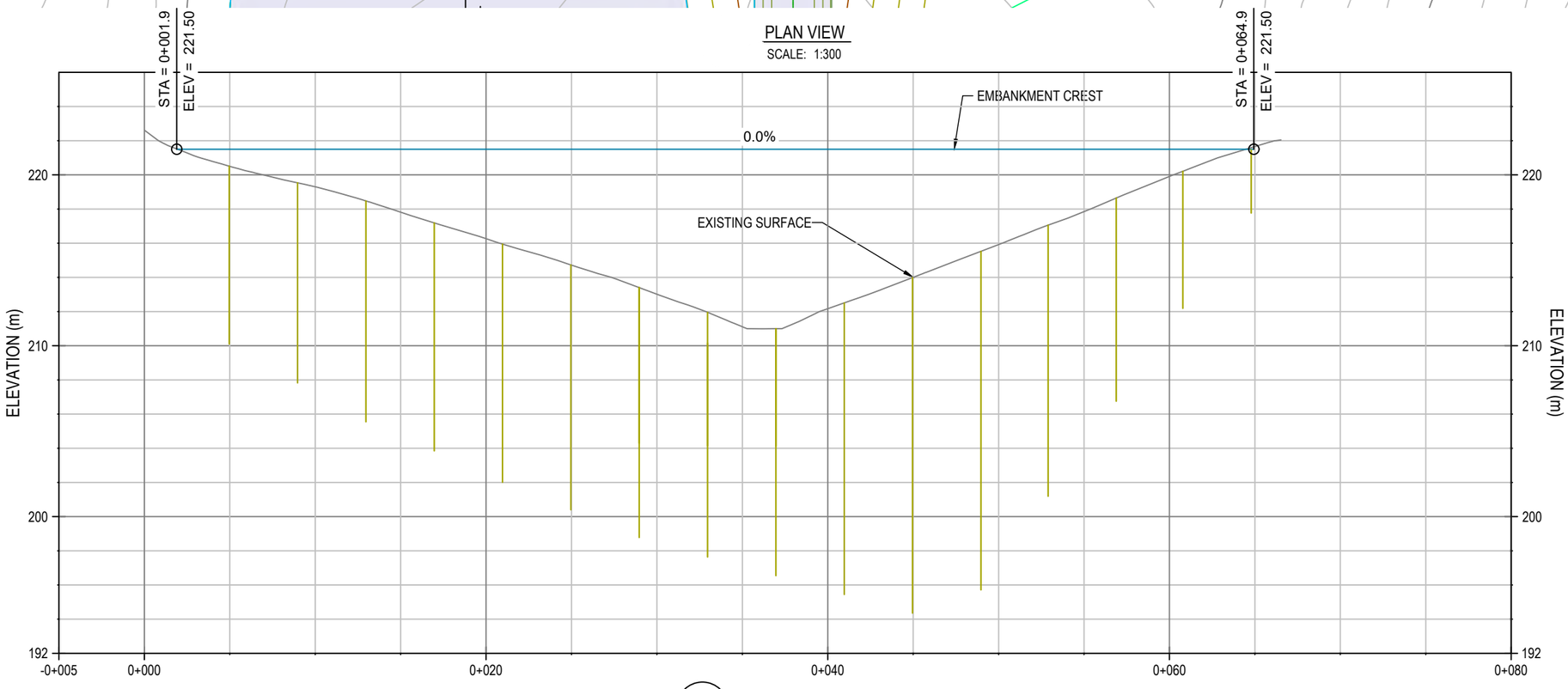
PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE	DATE		
EDM	FEBRUARY 06, 2024		

C033

C:\Users\robin.chen\Documents\Hongwei\Charlie\01-24-241\DWGS\DWGS for IFC\EARC03209-C012 C031-C035 C041-C043-C045-C046 Option W.dwg [C033] February 06, 2024 - 4:16:39 pm (BY: CHEN, ROBIN)



PLAN VIEW
SCALE: 1:300



C
C031
PROFILE VIEW
SCALE: 1:300

LEGEND:

- (S) - GROUT S..
- (P) - GROUT P..
- (T) - GROUT T..
- BEDROCK SURFACE
- EXISTING SURFACE
- EMBANKMENT CREST
- PRIMARY
- SECONDARY
- TERTIARY
- TEMPORARY PLATFORMS

0 15m
Scale: 1:300 @ 11"x17"

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
7. THE RAMP MUST BE MAINTAINED CLEAR OF SNOW, AND REGULARLY SANDED FOR TRACTION CONTROL.
8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT

BAFFINLAND IRON MINES CORPORATION

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

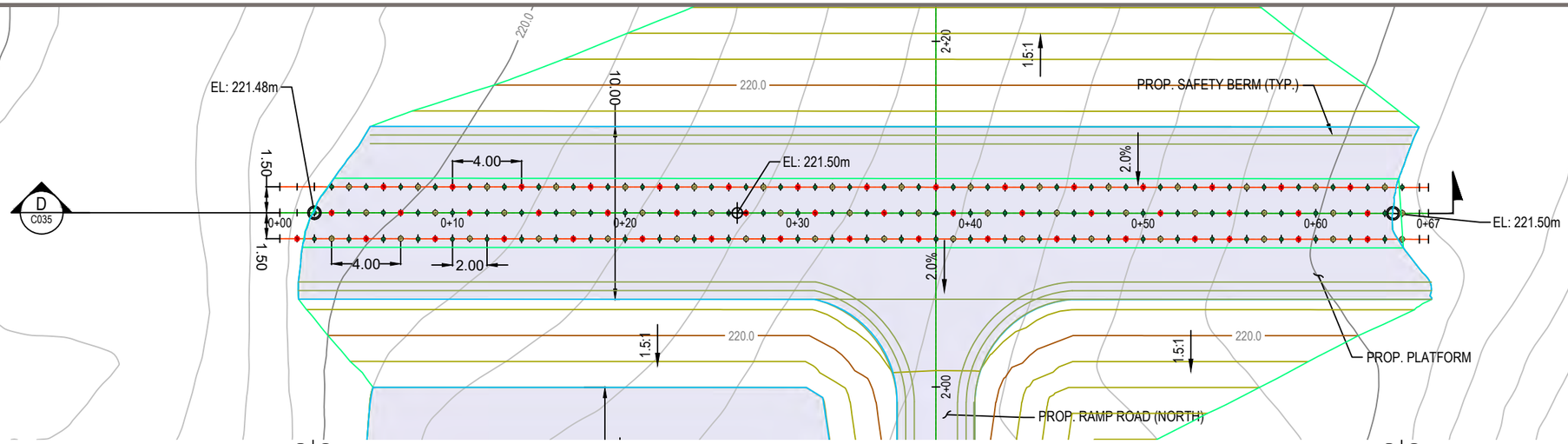
SECONDARY GROUT HOLES LAYOUT PLAN AND PROFILE VIEW

TETRA TECH

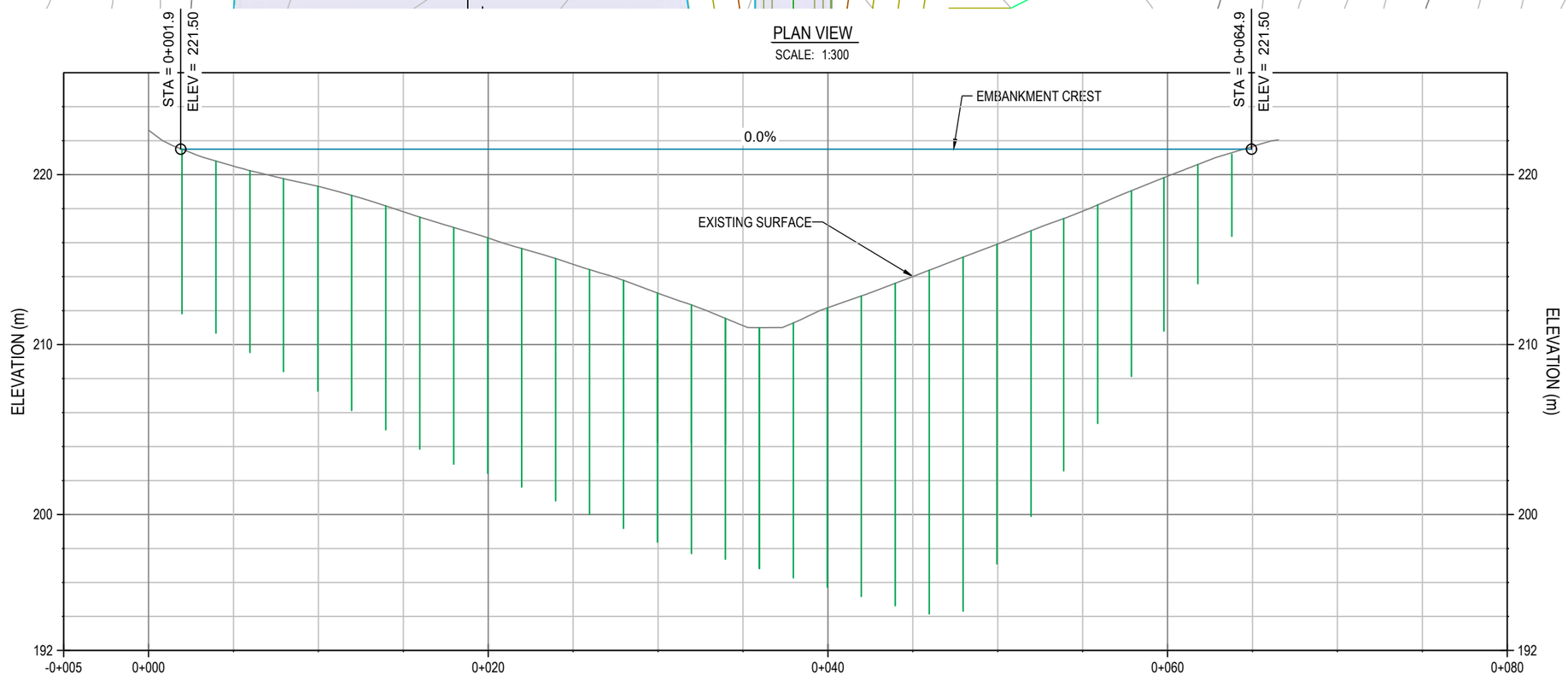
PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1

OFFICE	DATE
EDM	FEBRUARY 06, 2024

C034



PLAN VIEW
SCALE: 1:300



D
C031
PROFILE VIEW
SCALE: 1:300

LEGEND:

- Ⓢ - GROUT S..
- Ⓟ - GROUT P..
- Ⓣ - GROUT T..
- BEDROCK SURFACE
- EXISTING SURFACE
- EMBANKMENT CREST
- PRIMARY
- SECONDARY
- TERTIARY
- TEMPORARY PLATFORMS

0 15m
Scale: 1:300 @ 11"x17"

NOTES:
1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
7. THE RAMP MUST BE MAINTAINED CLEAR OF SNOW, AND REGULARLY SANDED FOR TRACTION CONTROL.
8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists
PERMIT

PROFESSIONAL SEAL

CLIENT
BAFFINLAND IRON MINES CORPORATION

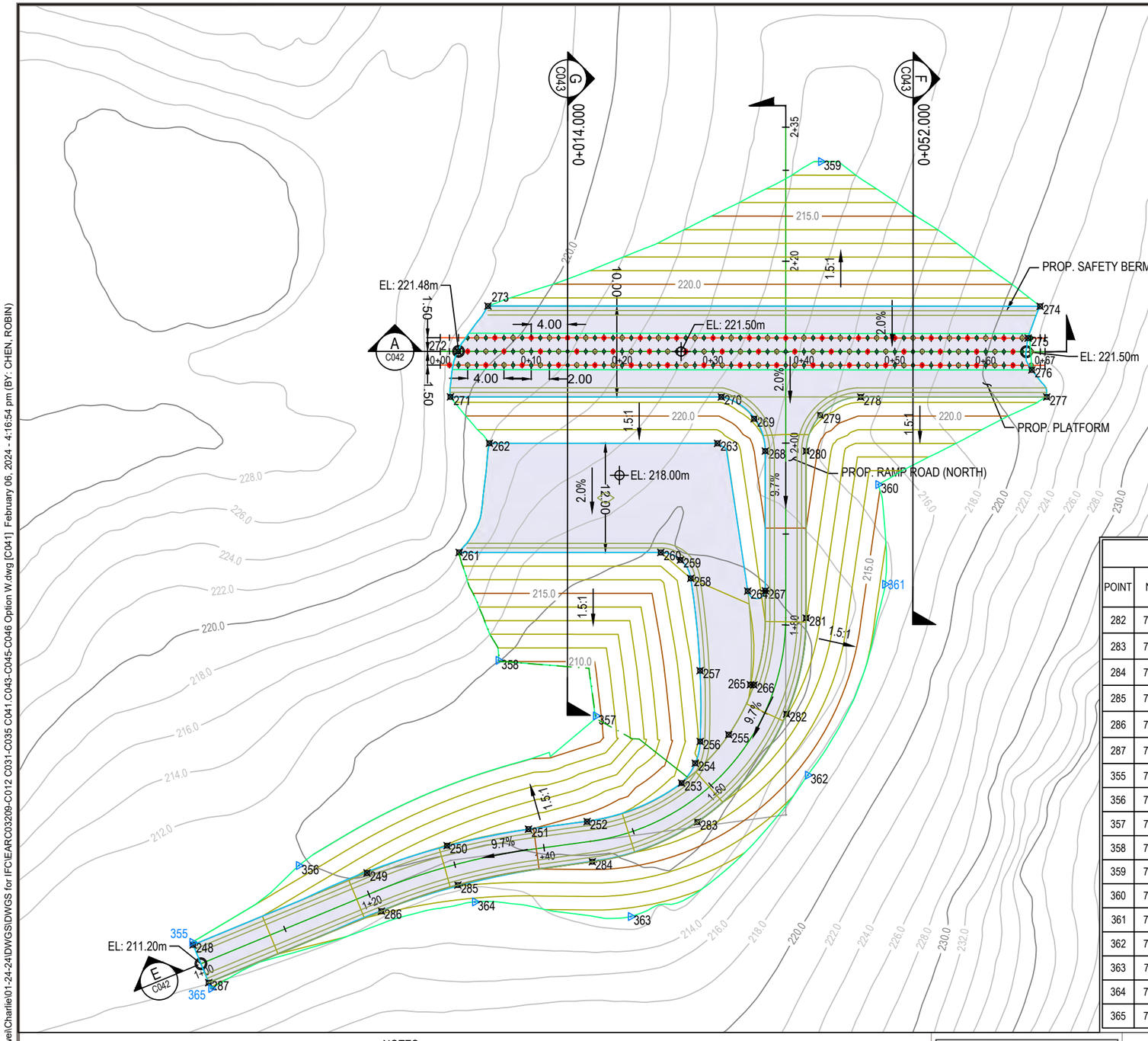
TETRA TECH

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

TERTIARY GROUT HOLES LAYOUT PLAN AND PROFILE VIEW

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE	DATE		
EDM	FEBRUARY 06, 2024		

C035



COORDINATION OF WORK POINTS LIST					
POINT	NORTHING	EASTING	ELEVATION (EXISTING)	ELEVATION (PROPOSED)	DESCRIPTION
248	7 913 075.86	562 335.23	211.00	211.199m	Ramp
249	7 913 095.00	562 327.32	210.00	213.209m	Ramp
250	7 913 103.80	562 324.32	210.00	214.085m	Ramp
251	7 913 112.76	562 322.51	210.00	214.945m	Ramp
252	7 913 119.21	562 321.68	209.85	215.578m	Ramp
253	7 913 129.61	562 317.45	209.38	216.695m	Ramp
254	7 913 131.11	562 315.27	209.20	216.951m	Ramp
255	7 913 134.79	562 312.12	209.07	217.508m	Ramp
256	7 913 131.65	562 312.87	209.01	217.120m	Platform2
257	7 913 131.64	562 305.08	209.04	217.601m	Platform2
258	7 913 130.61	562 294.94	209.80	218.000m	Platform2
259	7 913 129.49	562 292.91	209.95	218.000m	Platform2
260	7 913 127.32	562 292.09	210.00	218.000m	Platform2
261	7 913 105.14	562 292.08	217.99	218.000m	Platform2 & Work Area
262	7 913 108.46	562 280.08	218.00	218.000m	Platform2 & Work Area
263	7 913 133.56	562 280.08	210.97	218.000m	Platform2
264	7 913 136.89	562 296.33	209.83	218.041m	Platform2
265	7 913 137.18	562 306.63	209.11	217.973m	Platform2
266	7 913 137.57	562 306.66	209.14	218.238m	Ramp
267	7 913 138.82	562 296.30	209.95	219.330m	Ramp
268	7 913 138.82	562 280.94	211.89	220.818m	Ramp
269	7 913 137.59	562 277.38	211.13	221.238m	Ramp
270	7 913 133.98	562 274.98	211.40	221.400m	Platform1
271	7 913 104.18	562 274.98	221.37	221.400m	Platform1 & Work Area
272	7 913 105.02	562 269.98	221.50	221.500m	Platform1 & Work Area
273	7 913 108.30	562 264.99	221.60	221.600m	Platform1 & Work Area
274	7 913 169.05	562 265.01	221.60	221.600m	Platform1 & Work Area
275	7 913 167.73	562 268.51	221.53	221.530m	Platform1 & Work Area
276	7 913 168.14	562 272.01	221.46	221.460m	Platform1 & Work Area
277	7 913 169.78	562 274.99	221.40	221.400m	Platform1
278	7 913 149.32	562 274.99	215.09	221.395m	Platform1
279	7 913 144.87	562 276.99	213.61	221.263m	Ramp
280	7 913 143.32	562 280.93	213.41	220.823m	Ramp
281	7 913 143.32	562 299.30	210.27	219.042m	Ramp

COORDINATION OF WORK POINTS LIST					
POINT	NORTHING	EASTING	ELEVATION (EXISTING)	ELEVATION (PROPOSED)	DESCRIPTION
282	7 913 141.16	562 309.84	209.78	218.075m	Ramp
283	7 913 131.34	562 321.73	209.85	216.684m	Ramp
284	7 913 119.79	562 326.10	210.16	215.572m	Ramp
285	7 913 105.00	562 328.66	211.68	214.087m	Ramp
286	7 913 096.59	562 331.53	211.67	213.196m	Ramp
287	7 913 077.59	562 339.39	211.95	211.199m	Ramp
355	7 913 075.76	562 334.95	211.00	---	Work Area
356	7 913 087.49	562 326.51	210.15	---	Work Area
357	7 913 120.17	562 310.06	209.55	---	Work Area
358	7 913 109.46	562 303.95	210.09	---	Work Area
359	7 913 144.93	562 249.10	211.00	---	Work Area
360	7 913 151.24	562 284.62	214.98	---	Work Area
361	7 913 151.98	562 295.58	213.57	---	Work Area
362	7 913 143.49	562 316.57	214.21	---	Work Area
363	7 913 124.01	562 332.12	211.35	---	Work Area
364	7 913 106.87	562 330.51	212.72	---	Work Area
365	7 913 077.85	562 340.03	212.23	---	Work Area

LEGEND:

- (S) - GROUT S...
- (P) - GROUT P...
- (T) - GROUT T...
- ▲ - FOOTPOINT OF WORK AREA
- ⊠ - FOOTPOINT OF WORK POINT

0 25m

Scale: 1:500 @ 11"x17"

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
7. THE RAMP MUST BE MAINTAINED CLEAR OF SNOW, AND REGULARLY SANDED FOR TRACTION CONTROL.
8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT

BAFFINLAND IRON MINES CORPORATION

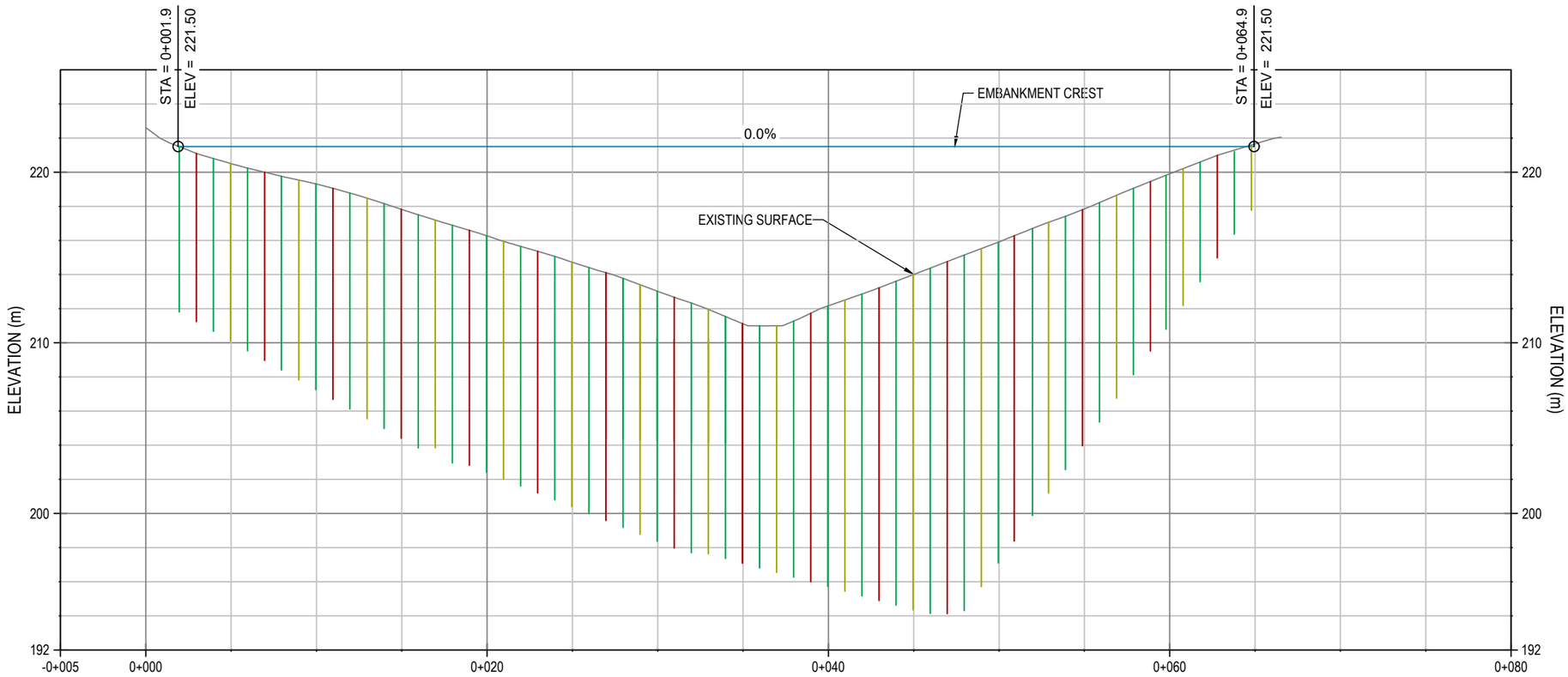
KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

TEMPORARY WORK PLATFORM LAYOUT PLAN VIEW

TETRA TECH

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE	DATE		
EDM	FEBRUARY 06, 2024		

C041

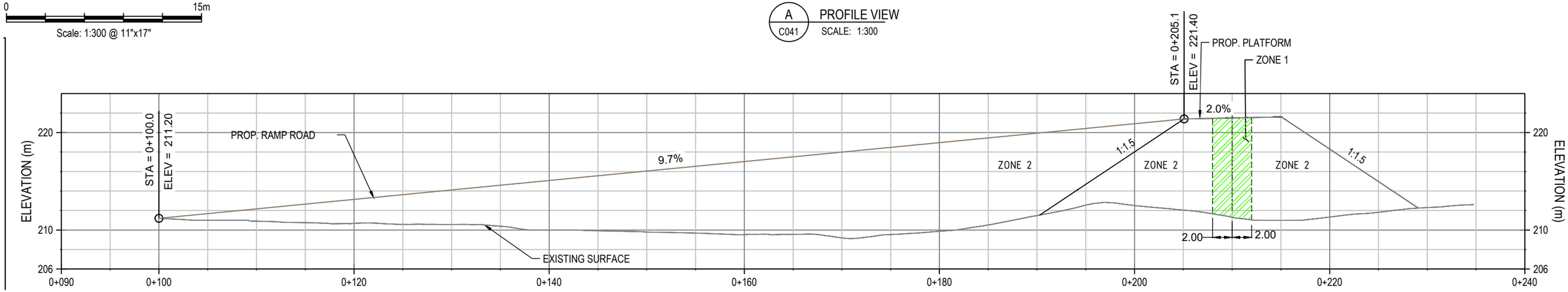


0 15m

Scale: 1:300 @ 11"x17"

A C041 PROFILE VIEW

SCALE: 1:300



0 20m

Scale: 1:400 @ 11"x17"

E C041 PROFILE VIEW

SCALE: 1:400

LEGEND:

- (S) - GROUT S..
- (P) - GROUT P..
- (T) - GROUT T..
- BEDROCK SURFACE
- EXISTING SURFACE
- EMBANKMENT CREST
- PRIMARY
- SECONDARY
- TERTIARY
- TEMPORARY PLATFORMS

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
7. THE RAMP MUST BE MAINTAINED CLEAR OF SNOW, AND REGULARLY SANDED FOR TRACTION CONTROL.
8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT

BAFFINLAND IRON MINES CORPORATION

TEMPORARY WORK PLATFORM PROFILES VIEW

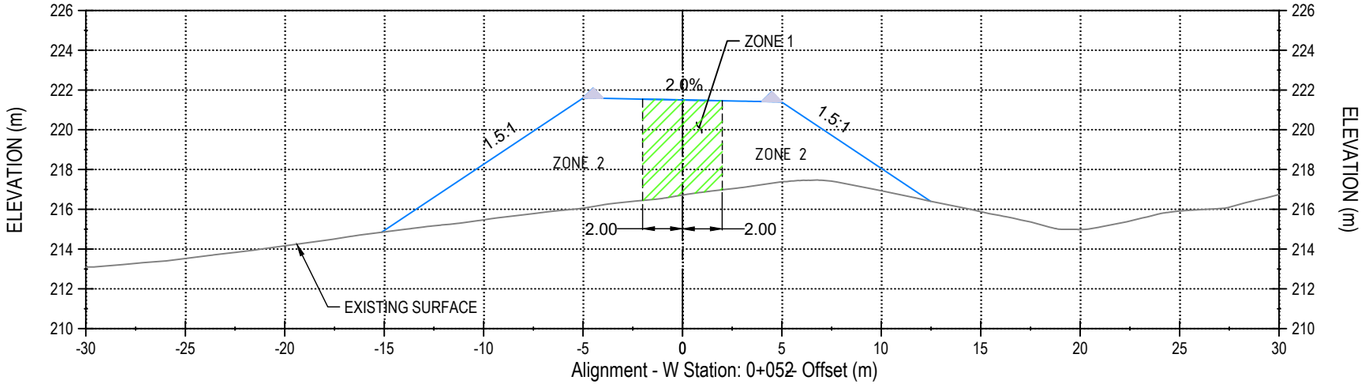
TETRA TECH

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1

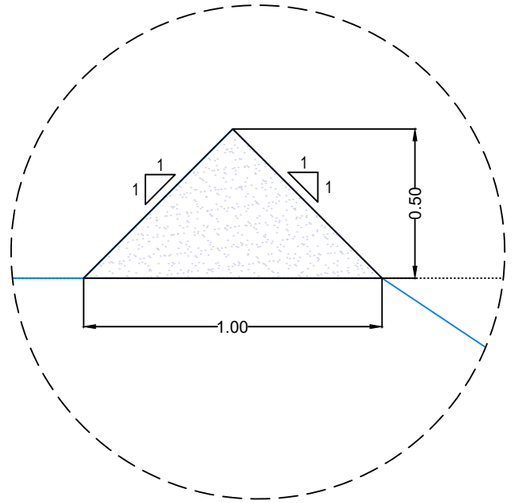
OFFICE	DATE
EDM	FEBRUARY 06, 2024

C042

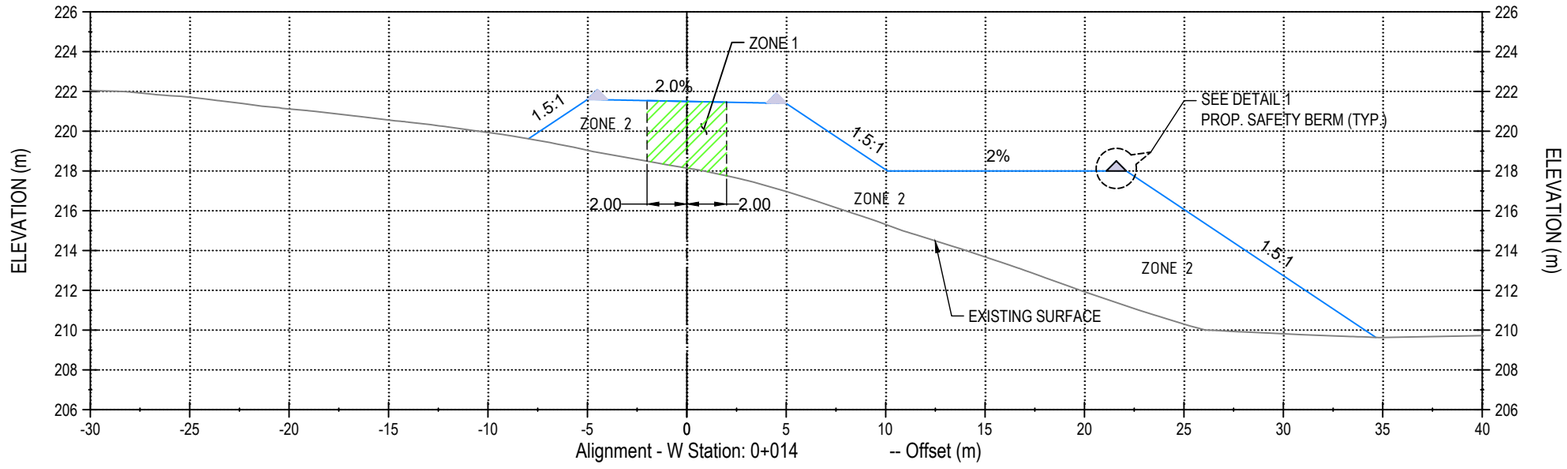
C:\Users\robin.chen\Documents\Hongwei\Charlie\01-24-24\DWGS\DWGS for IFC\EARC03209-C012 C031-C035 C041 C043-C045-C046 Option W.dwg [C042] February 06, 2024 - 4:16:58 pm (BY: CHEN, ROBIN)



F C041 SECTION VIEW
SCALE: 1:300



1 -- SAFETY BERM DETAIL
SCALE: 1:20



G C041 SECTION VIEW
SCALE: 1:300

LEGEND:

- S - GROUT S..
- P - GROUT P..
- T - GROUT T..
- BEDROCK SURFACE
- EXISTING SURFACE
- EMBANKMENT CREST
- PRIMARY
- SECONDARY
- TERTIARY
- TEMPORARY PLATFORMS

0 15m
Scale: 1:300 @ 11"x17"

NOTES:

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2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
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ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists
PERMIT

PROFESSIONAL SEAL

CLIENT
BAFFINLAND IRON MINES CORPORATION

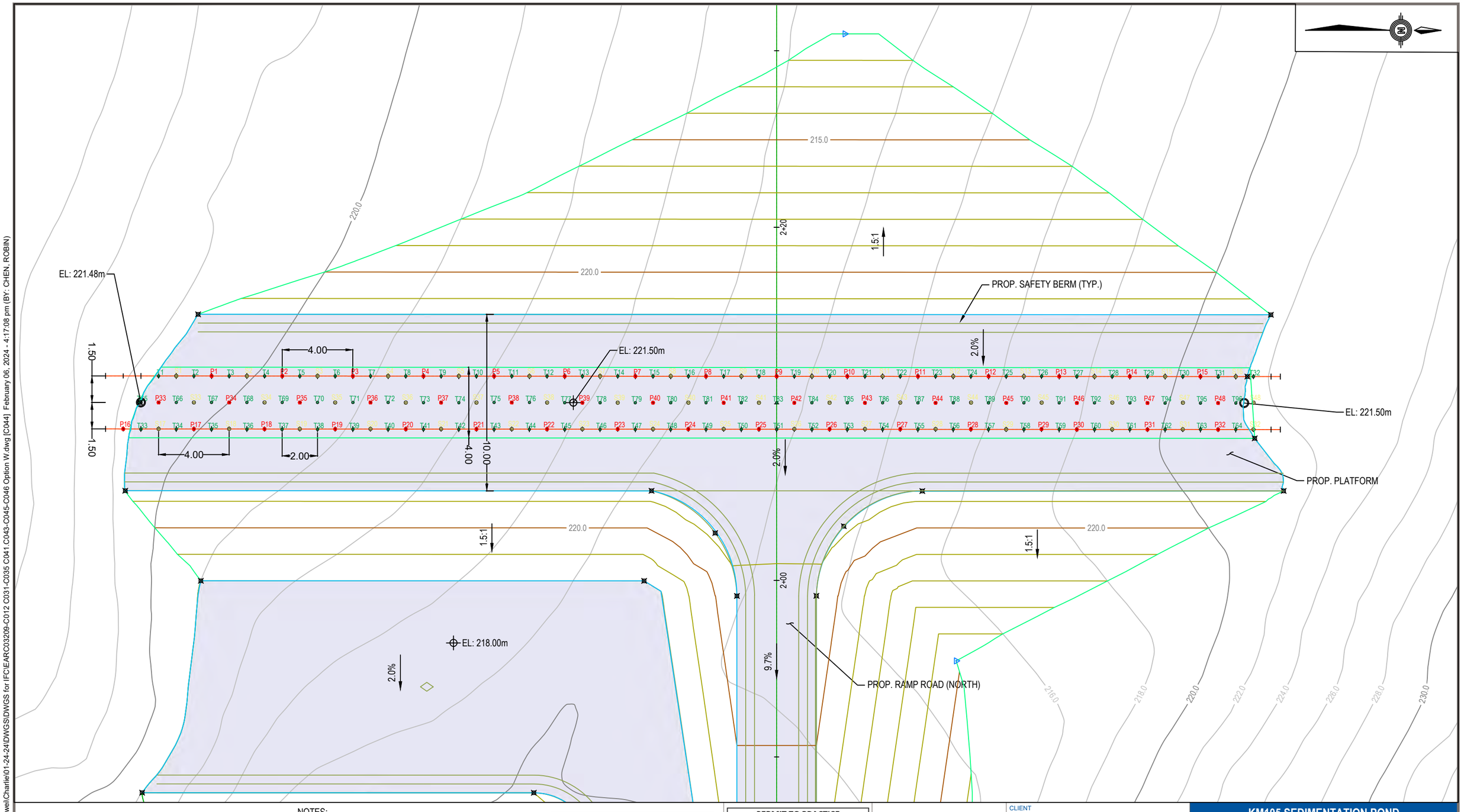
TETRA TECH

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

TEMPORARY ABUTMENT PLATFORM SECTIONS AND DETAIL VIEW

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE: EDM	DATE: FEBRUARY 06, 2024		

C043



LEGEND:

- Ⓢ - GROUT S..
- Ⓟ - GROUT P..
- Ⓣ - GROUT T..

0 10m

Scale: 1:200 @ 11"x17"

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
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ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT

BAFFINLAND IRON MINES CORPORATION

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

GROUT HOLES NUMBER LAYOUT PLAN VIEW

TETRA TECH

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE	DATE		
EDM	FEBRUARY 06, 2024		

C044

C:\Users\robin.chen\Documents\Hongwei\Charlie\01-24-24\DWGS\DWGS for IFC\EARC03209-C012 C031-C035 C041-C043-C045-C046 Option W.dwg [C044] February 06, 2024 - 4:17:08 pm (BY: CHEN, ROBIN)

COORDINATION OF GROUT HOLES LIST		
NAME	EASTING	NORTHING
P1	562 268.48	7 913 109.07
P2	562 268.48	7 913 113.07
P3	562 268.49	7 913 117.07
P4	562 268.49	7 913 121.07
P5	562 268.49	7 913 125.07
P6	562 268.49	7 913 129.07
P7	562 268.49	7 913 133.07
P8	562 268.50	7 913 137.07
P9	562 268.50	7 913 141.07
P10	562 268.50	7 913 145.07
P11	562 268.50	7 913 149.07
P12	562 268.50	7 913 153.07
P13	562 268.51	7 913 157.07
P14	562 268.51	7 913 161.07
P15	562 268.51	7 913 165.07
P16	562 271.48	7 913 104.07
P17	562 271.48	7 913 108.07
P18	562 271.48	7 913 112.07
P19	562 271.48	7 913 116.07
P20	562 271.49	7 913 120.07
P21	562 271.49	7 913 124.07
P22	562 271.49	7 913 128.07
P23	562 271.49	7 913 132.07
P24	562 271.49	7 913 136.07
P25	562 271.49	7 913 140.07
P26	562 271.49	7 913 144.07
P27	562 271.49	7 913 148.07
P28	562 271.49	7 913 152.07
P29	562 271.49	7 913 156.07
P30	562 271.51	7 913 158.07
P31	562 271.51	7 913 162.07
P32	562 271.51	7 913 166.07
P33	562 269.98	7 913 106.07
P34	562 269.98	7 913 110.07
P35	562 269.98	7 913 114.07

COORDINATION OF GROUT HOLES LIST		
NAME	EASTING	NORTHING
P36	562 269.98	7 913 118.07
P37	562 269.99	7 913 122.07
P38	562 269.98	7 913 126.07
P39	562 269.99	7 913 130.07
P40	562 269.99	7 913 134.07
P41	562 270.00	7 913 138.07
P42	562 270.00	7 913 142.07
P43	562 270.00	7 913 146.07
P44	562 270.00	7 913 150.07
P45	562 270.01	7 913 154.07
P46	562 270.01	7 913 158.07
P47	562 270.01	7 913 162.07
P48	562 270.01	7 913 166.07
S1	562 268.48	7 913 107.07
S2	562 268.48	7 913 111.07
S3	562 268.48	7 913 115.07
S4	562 268.49	7 913 119.07
S5	562 268.49	7 913 123.07
S6	562 268.49	7 913 127.07
S7	562 268.49	7 913 131.07
S8	562 268.50	7 913 135.07
S9	562 268.50	7 913 139.07
S10	562 268.50	7 913 143.07
S11	562 268.50	7 913 147.07
S12	562 268.50	7 913 151.07
S13	562 268.50	7 913 155.07
S14	562 268.51	7 913 159.07
S15	562 268.51	7 913 163.07
S16	562 268.51	7 913 167.07
S17	562 271.48	7 913 106.07
S18	562 271.48	7 913 110.07
S19	562 271.48	7 913 114.07
S20	562 271.49	7 913 118.07
S21	562 271.49	7 913 122.07
S22	562 271.49	7 913 126.07

COORDINATION OF GROUT HOLES LIST		
NAME	EASTING	NORTHING
S23	562 271.49	7 913 130.07
S24	562 271.49	7 913 134.07
S25	562 271.49	7 913 138.07
S26	562 271.49	7 913 142.07
S27	562 271.49	7 913 146.07
S28	562 271.49	7 913 150.07
S29	562 271.51	7 913 154.07
S30	562 271.51	7 913 160.07
S31	562 271.51	7 913 164.07
S32	562 271.51	7 913 168.07
S33	562 269.98	7 913 108.07
S34	562 269.98	7 913 112.07
S35	562 269.98	7 913 116.07
S36	562 269.99	7 913 120.07
S37	562 269.99	7 913 124.07
S38	562 269.99	7 913 128.07
S39	562 269.99	7 913 132.07
S40	562 270.00	7 913 136.07
S41	562 270.00	7 913 140.07
S42	562 270.00	7 913 144.07
S43	562 269.99	7 913 148.07
S44	562 269.99	7 913 152.07
S45	562 269.99	7 913 156.07
S46	562 269.99	7 913 160.08
S47	562 269.99	7 913 164.08
S48	562 270.00	7 913 168.07
T1	562 268.48	7 913 106.07
T2	562 268.48	7 913 108.07
T3	562 268.48	7 913 110.07
T4	562 268.48	7 913 112.07
T5	562 268.48	7 913 114.07
T6	562 268.48	7 913 116.07
T7	562 268.49	7 913 118.07
T8	562 268.49	7 913 120.07
T9	562 268.49	7 913 122.07

COORDINATION OF GROUT HOLES LIST		
NAME	EASTING	NORTHING
T10	562 268.49	7 913 124.07
T11	562 268.49	7 913 126.07
T12	562 268.49	7 913 128.07
T13	562 268.49	7 913 130.07
T14	562 268.49	7 913 132.07
T15	562 268.49	7 913 134.07
T16	562 268.50	7 913 136.07
T17	562 268.50	7 913 138.07
T18	562 268.50	7 913 140.07
T19	562 268.50	7 913 142.07
T20	562 268.50	7 913 144.07
T21	562 268.50	7 913 146.07
T22	562 268.50	7 913 148.07
T23	562 268.50	7 913 150.07
T24	562 268.50	7 913 152.07
T25	562 268.50	7 913 154.07
T26	562 268.50	7 913 156.07
T27	562 268.51	7 913 158.07
T28	562 268.51	7 913 160.07
T29	562 268.51	7 913 162.07
T30	562 268.51	7 913 164.07
T31	562 268.53	7 913 166.07
T32	562 268.51	7 913 168.07
T33	562 271.50	7 913 105.07
T34	562 271.50	7 913 107.07
T35	562 271.50	7 913 109.07
T36	562 271.50	7 913 111.07
T37	562 271.50	7 913 113.06
T38	562 271.50	7 913 115.07
T39	562 271.50	7 913 117.07
T40	562 271.50	7 913 119.07
T41	562 271.50	7 913 121.07
T42	562 271.50	7 913 123.07
T43	562 271.50	7 913 125.07
T44	562 271.50	7 913 127.07

COORDINATION OF GROUT HOLES LIST		
NAME	EASTING	NORTHING
T45	562 271.50	7 913 129.07
T46	562 271.50	7 913 131.07
T47	562 271.50	7 913 133.07
T48	562 271.50	7 913 135.07
T49	562 271.50	7 913 137.07
T50	562 271.50	7 913 139.07
T51	562 271.50	7 913 141.07
T52	562 271.50	7 913 143.07
T53	562 271.50	7 913 145.07
T54	562 271.50	7 913 147.07
T55	562 271.50	7 913 149.07
T56	562 271.50	7 913 151.07
T57	562 271.50	7 913 153.07
T58	562 271.51	7 913 155.07
T59	562 271.51	7 913 157.07
T60	562 271.51	7 913 159.07
T61	562 271.51	7 913 161.07
T62	562 271.51	7 913 163.07
T63	562 271.51	7 913 165.07
T64	562 271.51	7 913 167.07
T65	562 269.98	7 913 105.07
T66	562 269.98	7 913 107.07
T67	562 269.98	7 913 109.07
T68	562 269.98	7 913 111.07
T69	562 269.98	7 913 113.07
T70	562 269.98	7 913 115.07
T71	562 269.98	7 913 117.07
T72	562 269.98	7 913 119.07
T73	562 269.99	7 913 121.07
T74	562 269.99	7 913 123.07
T75	562 269.98	7 913 125.07
T76	562 269.98	7 913 127.07
T77	562 269.99	7 913 129.07
T78	562 269.99	7 913 131.07
T79	562 269.99	7 913 133.07

COORDINATION OF GROUT HOLES LIST		
NAME	EASTING	NORTHING
T80	562 270.00	7 913 135.07
T81	562 270.00	7 913 137.07
T82	562 270.00	7 913 139.07
T83	562 270.00	7 913 141.07
T84	562 270.00	7 913 143.07
T85	562 270.00	7 913 145.07
T86	562 270.00	7 913 147.07
T87	562 270.00	7 913 149.07
T88	562 270.00	7 913 151.07
T89	562 270.00	7 913 153.07
T90	562 270.01	7 913 155.07
T91	562 270.01	7 913 157.07
T92	562 270.01	7 913 159.07
T93	562 270.01	7 913 161.07
T94	562 270.01	7 913 163.07
T95	562 270.01	7 913 165.07
T96	562 270.01	7 913 167.07

**NOTES:
P# -- PRIMARY GROUT HOLE
S# -- SECONDARY GROUT HOLE
T# -- TERTIARY GROUT HOLE

NOTES:
1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
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ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists
PERMIT

PROFESSIONAL SEAL

CLIENT
BAFFINLAND IRON MINES CORPORATION

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

COORDINATION OF GROUT HOLES NUMBER LIST

TETRA TECH

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1

OFFICE	DATE
EDM	FEBRUARY 06, 2024

C045

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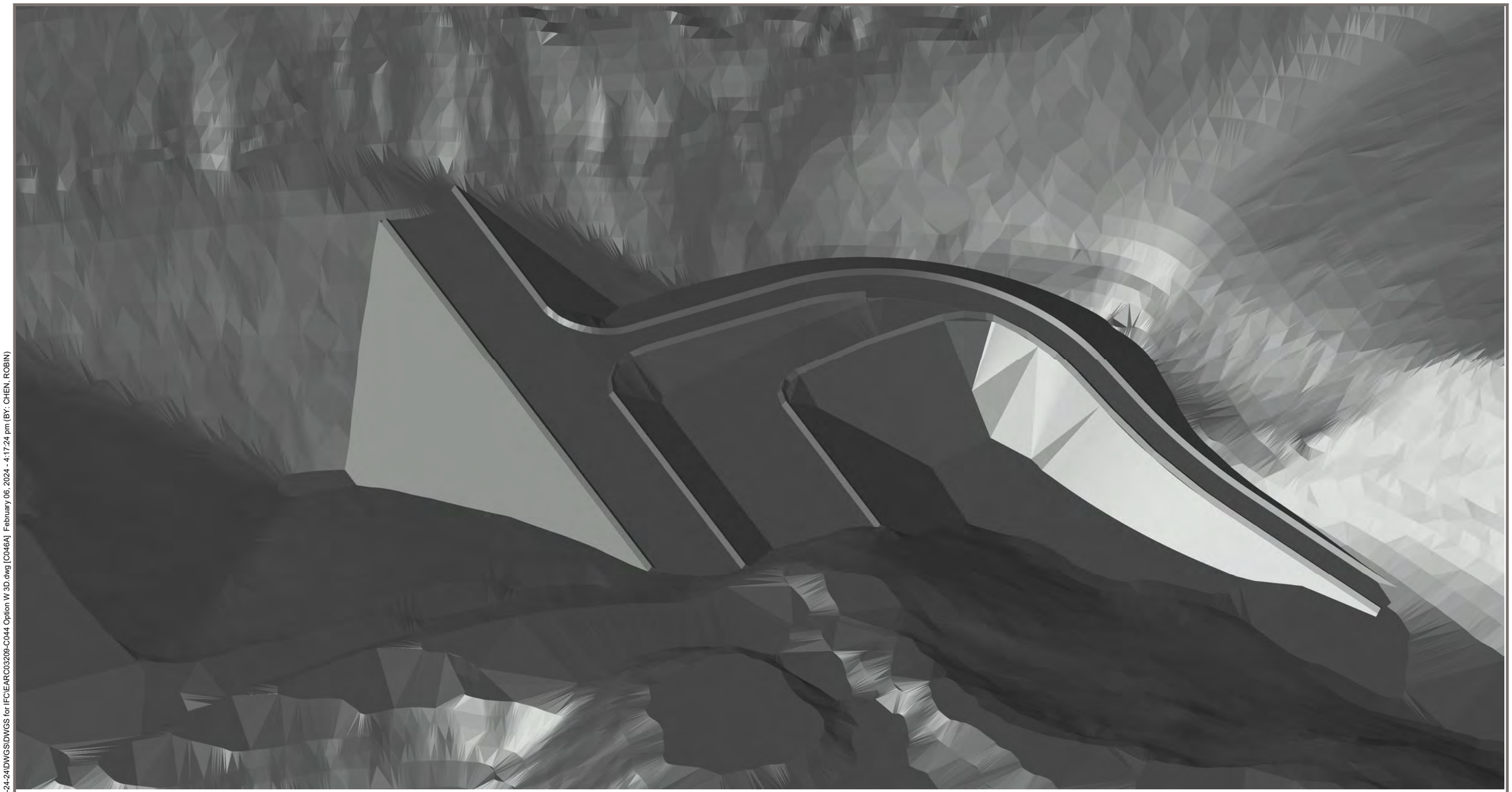


3D VIEW
SCALE: NTS

ISSUED FOR CONSTRUCTION

NOTES:
1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT
BAFFINLAND IRON MINES CORPORATION

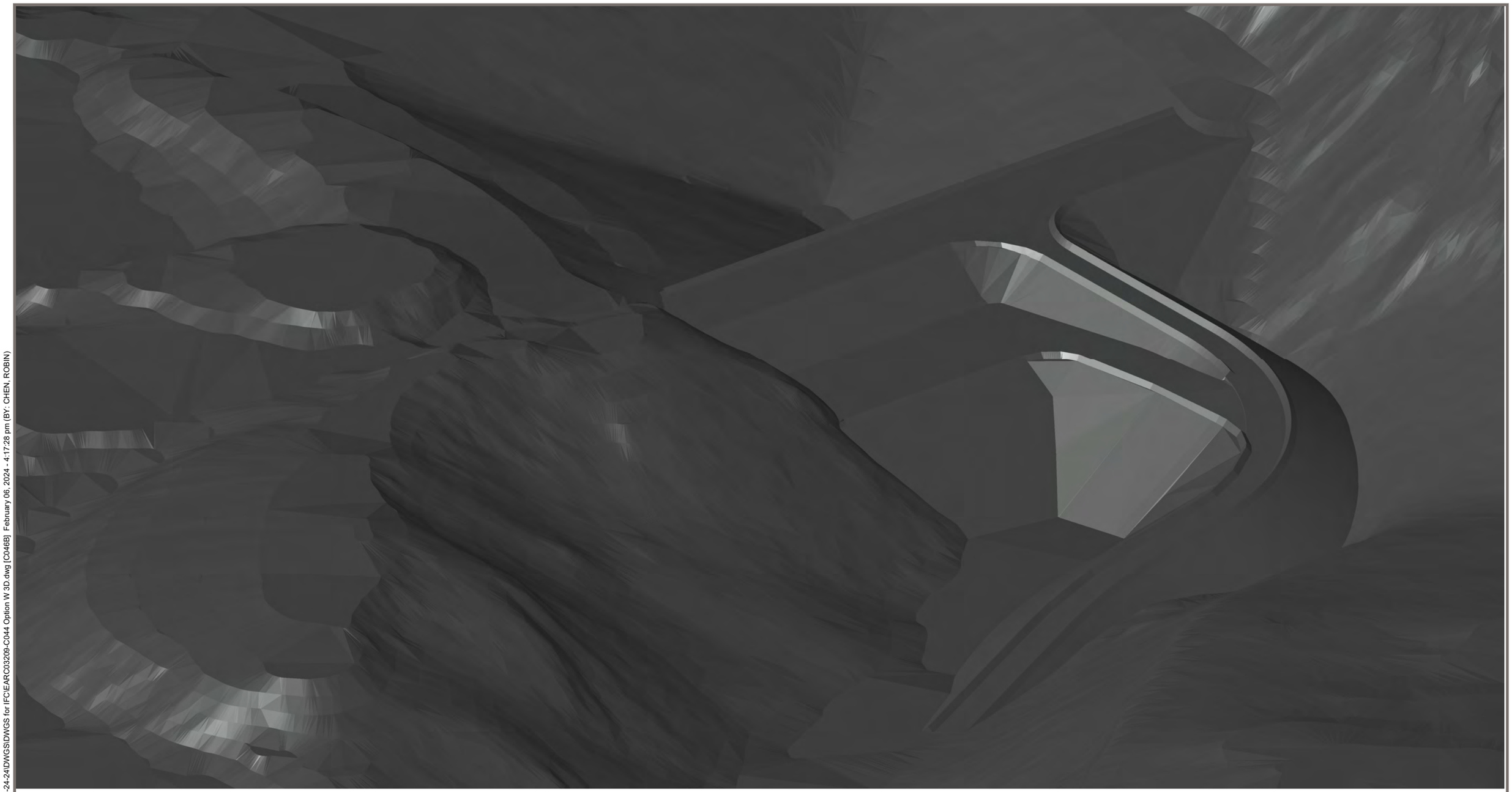
TETRA TECH

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

TEMPORARY WORK PLATFORM LAYOUT 3D VIEW A

PROJECT NO.	DWN	CKD	REV	
ENG. EARC03209-10	RC	CH	1	**C046A**
OFFICE	DATE			
EDM	FEBRUARY 06, 2024			

C:\Users\robin.chen\Documents\Hongwei\Charlie\01-24-24\DWGS\DWGS for IFC\EARC03209-C044 Option W 3D.dwg [C046A] February 06, 2024 - 4:17:24 pm (BY: CHEN, ROBIN)



3D VIEW
SCALE: NTS

ISSUED FOR CONSTRUCTION

NOTES:
1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT
BAFFINLAND IRON MINES CORPORATION

TETRA TECH

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

TEMPORARY WORK PLATFORM LAYOUT 3D VIEW B

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE	DATE		
EDM	FEBRUARY 06, 2024		

C046B

ᖁᑭᖅᑕᓂᒃ ᐃᓄᐃᑦ ᑲᑎᒪᔨᑎᒋᔭᖏᑦ
Qikiqtani Inuit Association

ᐱᓕᕆᔨᖅᑐᑦ ᓄᓇᕗᒻᒥᒃ ᐅᑯᓂᖓᓄᑦ
Serving the communities of

ᐃᑲᓗᐊᖅᓯᒪᔪᖅ Arctic Bay | ᑲᖏᖅᑐᑦᑎᐊᖅ Clyde River | ᐊᐅᓚᐃᑦᑕᕐᓂᖅ Grise Fiord | ᐃᓚᓪᓕᖅ Igloolik | ᐃᖅᓯᓗᐃᑦ Iqaluit | ᑭᒥᒥᓕᑦ Kimmirut | ᑭᙵᓚᐃᑦ Kinngait | ᐱᖓᓐᓂᑦᑐᖅ Pangnirtung | ᑎᑎᒪᒋᔪᖅ Pond Inlet | ᖁᑭᖅᑕᐅᔪᓐᓇᖅ Qikiqtarjuaq | ᕆᐅᓱᑉᑕᖅ Resolute Bay | ᓴᓂᑭᓗᓐᓇᖅ Sanikiluaq | ᓴᓂᓯᒃ Sanirajak

December 6, 2023

Elisabeth Luther, Senior Manager of Regulatory Affairs
360 Oakville Place Drive, Suite 300 Oakville, ON L6H 6K8
647 382 3761
Elisabeth.Luther@baffinland.com

RE: QIA 2023 Environmental Audit Report for the Mary River Project

Ms. Luther,

The Qikiqtani Inuit Association (QIA) contracted M.A. O' Kane Consultants Inc. (Okane) to complete the 2023 Environmental Audit (Audit) of the Mary River Project (Project), operated by Baffinland Iron Mines Corporation (Baffinland). This Audit was completed in accordance with Schedule D and E of the Commercial Lease No.: Q13C301[1] (Lease). The focus of the Audit was to verify the adequacy of environmental security provided by Baffinland pursuant to the Lease.

The 2023 Environmental Audit Report has been appended to this letter for Baffinland's reference.

QIA thanks Baffinland for its support in completing the 2023 Environmental Audit and will be available to discuss the findings upon request.

Nakurmiik,

Conor Goddard
Manager of Project Compliance and Monitoring
Qikiqtani Inuit Association
(P) 867.975.8385 or toll-free 1.800.667.2742
cgoddard@qia.ca

[1] QIA and Baffinland (2013). Commercial Lease No. Q13C301. September 6, 2013.

955-221 Mary River Mine 2023 Environmental Audit

November 17, 2023

okane

Integrated Mine Closure and Relinquishment Solutions

955-221 Mary River Mine 2023 Environmental Audit

955-221-R-001

November 2023

Prepared for:

Qikiqtani Inuit Association

Prepared by:

Travis Polkinghorne
Intermediate Engineer
tpolkinghorne@okc-sk.com

M.A. O'Kane Consultants Inc.

112 - 112 Research Drive
Saskatoon, SK S7N 3R3
Canada

Telephone: (306) 955 0702
Facsimile: (306) 955 1596
Web: www.okc-sk.com

Rev. #	Rev. Date	Author	Reviewer Sign-off	Major Changes
0	November 17, 2023	TP	DC	
1	December 1, 2023	TP	DC	

EXECUTIVE SUMMARY

Okane Consultants (Okane) was retained by the Qikiqtani Inuit Association (QIA) to conduct an annual security estimate from 2024 to 2026 for costs associated with closure and reclamation of the Mary River Mine operated by Baffinland Iron Mines Corporation (BIM). Mary River is a high-grade iron ore mine located north of the Arctic Circle in the Qikiqtani region of North Baffin Island, Nunavut, Canada. The majority of the project is located on Inuit-Owned Land managed by the QIA. Baffinland and QIA signed a Commercial Lease which includes the provisions for the annual assessment of reclamation security. To assist in the annual security estimate process, Okane will conduct annual environmental audits from 2023 to 2025 to identify areas of concern and uncertainty for the upcoming years security estimate. The on site portion of the 2023 environmental audit took place from August 31st - September 4th, 2023. Additionally, a desktop review of key documents (requested by QIA and provided by BIM) was completed by Okane to supplement the onsite portion of the environmental audit.

Okane's key findings from the 2023 Environmental Audit include:

- PAG waste rock is currently being placed around the exterior of the WRF in anticipation of its footprint expanding. In the event of an unplanned closure, it would be necessary to ensure 25 m of NAG rock is encapsulating all PAG rock to comply with the ICRP. This will have substantial implications on the annual security.

- The ICRP is not clear on BIMs plan for blasted rock slopes in an unplanned closure. The ICRP does state that a stability assessment will be completed on pit walls to determine what will be done at closure, that assessment has not yet been completed. In addition to the physical stability of the blasted rock slopes, the implications to water quality from exposed PAG material is also unknown. This is a large source of uncertainty that can possibly have a substantial impact on reclamation security.

- Long term water quality modelling has not been completed for runoff from the active mine area and contact water from the WRF. Currently, Metal and Diamond Mining Effluent Regulations (MDMER) criteria are exceeded at times in samples collected at MS-08, which receives runoff from both the active mine area (570 sump) and the WRF. Long term water quality modelling will help to inform on water treatment periods post-closure, which could have a substantial impact on reclamation security.

- Thermal modelling of the WRF has not been completed to understand the thermal regime within the WRF under future conditions, or under any climate change scenarios. This will be essential in understanding and ensuring the efficacy of BIMs planned cover system and could even result in a change in the thickness of the planned cover system which will be a large contributor to reclamation security.

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1 INTRODUCTION

Okane Consultants (Okane) was retained by the Qikiqtani Inuit Association (QIA) to conduct an annual security estimate for each year from 2024-2026 for costs associated with closure and reclamation of the Mary River Mine operated by Baffinland Iron Mines Corporation (BIM). Mary River is a high-grade iron ore mine located north of the Arctic Circle in the Qikiqtani region of North Baffin Island, Nunavut, Canada. The majority of the project is located on Inuit-owned Land managed by the QIA. Baffinland and QIA signed a Commercial Lease which includes the provisions for the annual assessment of reclamation security. To assist in the annual security estimate process, Okane will conduct annual environmental audits from years 2023 to 2025 to identify areas of concern and uncertainty for the upcoming years security estimate. The on site portion of the 2023 environmental audit took place from August 31st - September 4th, 2023 and was performed by two Okane personnel accompanied by a member of QIA. Additionally, a desktop review of key documents (requested by QIA and provided by BIM (Appendix A)) and information was completed by Okane to supplement the onsite portion of the environmental audit.

1.1 Project Objectives and Scope

The overarching objective of completing the annual environmental audits and security estimates is to provide QIA with a transparent, detailed understanding of reclamation security and requirements associated with the Mary River Mine. Specifically, the annual environmental audits are to provide QIA a better understanding of the Mary River Project operations and infrastructure, and thus overall reclamation requirements, that can then be used to more accurately assess reclamation security.

1.2 Variance in Environmental Audit Process

Okane's general approach to the environmental audit process is to first identify key information gaps and areas of relatively large uncertainty relating to the annual security estimate and then work with QIA to fill in information gaps and minimize uncertainty, likely by conducting further studies and analysis of the Mary River Mine site and its related infrastructure. Okane plans to first address components that will have the most substantial impact on the security estimate, with the aim of refining the security estimate each year. A more detailed explanation and examples of high priority areas can be found in Section 5.

This approach differs significantly from previous environmental audits (Arktis, 2022), which focus heavily on details of the project such as rips in geosynthetic liners and floating debris in containment berms. Such details are not unimportant and can indicate larger patterns of environmental mismanagement or negligence, but with respect to the overall security estimate are marginal compared to components such as closure of the site Waste Rock Facility (WRF) or length of time water treatment may be necessary; two areas Okane has focused on in this environmental audit.

1.3 Report Organization

For convenient reference, this report has been divided into the following sections:

- Section 2 – summarizes the Mary River Mine sites operations, key infrastructure, and site components.
- Section 3 – summarizes the site visit portion of the environmental audit, including the methodology and key observations.
- Section 4 – summarizes the desktop review of the environmental audit, including a list of documents reviewed and the justification for their review.
- Section 5 – discusses key findings from the site visit and desktop review.
- Section 6 – outlines recommendations for BIM including improved environmental practices, documentation that may help improve the accuracy of the annual security estimate.

2 SITE BACKGROUND

The Mary River Mine site is a high-grade iron ore mine located on North Baffin Island, Nunavut, Canada. The site consists of four main areas: Milne Port, Tote Road, Steensby Port, and the Mine Site. To date, major infrastructure has been developed at the Milne Port, Tote Road and the Mine Site (Table 2.1). Mary River Project began operations in 2013, shipping approximately 4.2 million tonnes of ore per year and expanding to approximately 6.0 million tonnes per year in 2018, with plans to expand operations with the construction of a railway to Steensby Port, which would increase production to allow for shipping of 18 million tonnes of ore per year.

Table 2.1: Constructed Major Infrastructure

Area	Major Infrastructure	
Milne Port	Ore Dock	Polishing Waste Stabilization Pond (PWSP)
	Ore Stockpile	Waste Management Facilities
	Ore Handling Facilities	Incinerator
	Service Buildings	Hazardous Material Storage Areas
	Sewage Treatment Plant	Power Generation Distribution
Mine Site	Waste Rock Stockpile	PWSPs
	Transitional Ore Stockpiles	Maintenance Facilities
	Blasted Bedrock Outcrop	Waste Management Facilities
	Mine Site Roads and Laydowns	Incinerators
	Camp Lake Water Supply	Landfill
	Quarries and Borrow Pits	Hazardous Material Storage Areas
	Power Generation and Distribution	Crushing Facilities
	Camp and Service Buildings	Airstrip
	Sewage Treatment	Emulsion Plant
Tote Road	Road Embankments and Driving Surface	Borrow Pits and Quarries
	Water Crossings	Roadside Laydowns
	Telecom Towers	

2.1 Interim Closure and Reclamation Plan

An interim closure and reclamation plan has been developed to guide closure activities for each main area and includes both a temporary and permanent closure period. As security estimates are primarily concerned with permanent closure activities, temporary closure activities have been excluded from this memorandum. The main work items for final mine closure and reclamation include (BIM, 2018):

- Filling the open pit with water to stabilize pit walls and mitigate fall hazards;
- Installation of a boulder fence and signage around the open pit to prevent inadvertent access;
- Removal of all mining and transportation infrastructure other than the Open Pit, Waste Rock Stockpile, Tote Road, and Milne Port Ore Dock. The Tote Road and Milne Port Ore Dock will be left in place after the project life, but not maintained.
- Demolition and removal of all buildings and foundations;
- All mining materials and equipment will either be removed from site or disposed of in on-site landfills/approved waste disposal areas;
- Removal of all hazardous waste and wastes to licensed disposal facilities;
- Disposal of non-hazardous waste on-site;
- Removal of water management systems and infilling of mine water ponds;
- Roads, airstrips, and development areas will be re-contoured as required;
- Removal of water crossings to restore natural drainage patterns;
- Scarification of disturbed areas of former mine infrastructure to encourage natural vegetation; and
- Monitoring during closure and post closure periods.

3 SITE VISIT SUMMARY

The 2023 site visit portion of the environmental audit took place between August 31st and September 4th 2023 by two members of Okane's project team accompanied by one member of QIA (Table 3.1). The site visit included inspections of key project components and infrastructure at the Mine Site, Milne Port and Tote Road, as well as a flight over the Steensby Port site location and railroad alignment. Specific infrastructure inspected and relevant observations are discussed below.

Table 3.1: Site Visit Personnel

Name	Organization	Role
Chris Spencer	QIA	Assistant Director, Lands and Resource Management
Dave Christensen	Okane	Senior Engineer
Travis Polkinghorne	Okane	Project Coordinator/Intermediate Engineer

3.1 Mine Site

The Mine Site was inspected on the dates of August 31st and September 1st. Project components inspected at the Mine Site included:

- WRF and WRF collection pond (MS-08)
- Water treatment facility
- KM 106 Stockpile and associated collection pond (MS-07)
- Blasted bedrock outcrop (active mining face) and associated sump (570 sump)
- Ore crusher pad and associated collection pond (MS-06)
- Landfill and Landfarm
- PWSP
- Incinerator
- Hazardous waste storage areas
- KM 105 settling pond dam embankment

Specific observations regarding each site component are discussed below in the coming sections.

3.1.1 Waste Rock Facility

Okane and QIA toured the WRF on August 31st, and flew over the area on September 2nd. Key observations pertaining to the WRF include:

- There appeared to be several different areas where waste rock was being deposited at the time of the site visit, indicating separation of NAG and PAG material according to BIMs waste rock deposition plan (BIM, 2018). However, NAG vs PAG disposal locations within the WRF did not appear to be visually delineated (Figure 3.1)

Figure 3.1: WRF Plateau showing multiple deposition areas.

3.1.2 MS-08 Water treatment facility

Okane and QIA toured the water treatment facility on August 31st. Key observations included:

- Discussion with the operator of the facility indicated that in periods of increased rainfall, water collected in MS-08 commonly required increased treatment for low pH levels. Low pH levels are also common during water quality sampling of MS-08, indicating the presence of Acid Rock Drainage (ARD) caused by seepage from the WRF and/or water pumped from the 570 Sump, which collects contact water from the active mine face.

- The operator of the facility also indicated that it was in the current work plans to construct a fourth containment berm at the water treatment plant facility.

3.1.3 MS-08

Okane and QIA toured the MS-08 collection pond on August 31st and visited again on September 4th. Key observations included:

- A secondary containment berm containing standing water is present to the north of MS-08, indicating that either seepage is occurring from the WRF below MS-08 and into the secondary containment berm, or that the geosynthetic liner installed in MS-08 is allowing seepage through it (Figure 3.2).

Figure 3.2: MS-08 and secondary containment pond to the North.

3.1.4 KM 106 Stockpile and MS-07

The KM 106 Stockpile (or transitional material stockpile) was toured by Okane and QIA on August 31st. Key observations included:

- A seepage path that appears to come from the stockpile that bypasses MS-07 completely (Figure 3.3)

Figure 3.3: Seepage path bypassing MS-07 sediment pond.

- A secondary containment pond to the east of MS-07 with standing water. A pump was present at the location but not currently operating (Figure 3.4). This, along with the seepage path noted in the above observation, indicate that contact water from the KM 106 stockpile is not collected in MS-07 in its entirety and that contact water is entering the surrounding environment.

Figure 3.4: Secondary containment pond east of KM 106 stockpile

3.1.5 Blasted Bedrock Outcrop (Active Mining Face) and 570 sump

The active mining area and 570 sump were toured on September 1st by Okane and QIA. Key observations of the area included:

- Runoff from the active mine area above the elevation of 570 masl is collected in the 570 sump (Figure 3.5) and pumped to the MS-08 sediment pond to be treated indicating that PAG contact water from the active mine area may be contributing to low pH values observed in MS-08 (see Section 3.1.2).

Figure 3.5: 570 sump

- There is no collection sump below the elevation of 570 masl where the drilling and blasting was occurring at the time of Okane and QIAs site visit, indicating pH impacted water is potentially entering the surrounding environment from elevations below 570 masl.
- Material classification appeared to be done visually, at least in part, as blasted material was not clearly delineated by its classification (PAG, NAG, etc).
- Blasted pit walls are at a near vertical angle, indicating that in the event of unplanned closure work may be required for long term stability.

3.1.6 Landfill and Landfarm

The Landfill and Landfarm were toured by Okane and QIA on September 1st. Key observations included:

- The inner slopes of Landfarm containment berms are beginning to show signs of slumping (Figure 3.6)

Figure 3.6: Slumping beginning on inner berm of Landfarm.

- A large section of geosynthetic liner material is exposed on the inner berm of the Landfarm (Figure 3.7)

Figure 3.7: Exposed geosynthetic liner on inside of Landfarm berm.

- Uncontrolled runoff to the surrounding environment was occurring to the West of Landfill (Figure 3.8)

Figure 3.8: Uncontrolled runoff from landfill to surrounding environment.

3.1.7 Ore Crusher Pad and MS-06

Okane and QIA toured the Ore Crusher Pad and MS-06 on August 31st. Key observations included:

- Uncontrolled seepage from the ore crusher pad is occurring to the southeast of MS-06 directly into the surrounding environment.

3.1.8 Mine Site PWSP

The PWSP was visited by Okane and QIA on September 1st. Key observations included:

- The west slope of the containment berm is relatively steep (estimated to be 1.5H:1V) compared to the rest of the containment berm slopes.
- Various debris was found floating in the PWSP.
- The inner slopes of the PWSP containment berms are beginning to show signs of slumping.
- The geosynthetic membrane lining the PWSP is exposed in multiple locations.

3.2 Milne Port

The Milne Port area was inspected by Okane and QIA on September 2nd. Project components inspected at Milne Port include:

- Ore stockpile area.
- Surface water collection ponds surrounding the ore stockpile area.
- PWSP.
- Hazardous waste containment berms.

Specific observations for key project components are discussed in the coming sections.

3.2.1 Milne Port PWSP

Okane and QIA inspected the Milne Port PWSP on September 2nd. Key observations included:

- Exposed geosynthetic liner in multiple locations of the PWSP berm.
- Slumping of the interior PWSP berm.

3.2.2 Hazardous Waste Containment Berms

Okane and QIA inspected the Milne Port PWSP on September 2nd. Key observations included:

- Exposed geotextile on multiple locations on the containment berms

3.3 Tote Road

The Tote Road was inspected by QIA and Okane on September 2nd, with a focus on bridge crossings and their abutments. Scour protection on all crossings looked to be sufficient and in good condition (Figure 3.9). While the constructed retaining wall bridge abutments do appear to have settled (Figure 3.10) further settlement is inhibited by the bridge structures themselves.

Figure 3.9: Tote Road Bridge Abutment Armouring at most northern bridge

Figure 3.10: Settlement in Bridge Abutment retaining wall

4 DESKTOP REVIEW SUMMARY

As a part of the 2023 Environmental Audit, Okane performed a desktop review of relevant documents as provided by BIM (Appendix A) to identify potential issues and risks pertaining to the closure and security of the Mary River Mine site. The documents provided at Okane and QIAs request and reviewed by Okane are shown in Appendix B Specific findings and recommendations from the desktop review are discussed in Sections 5 and 6, while this section summarizes what was reviewed, and why.

4.1 Waste Rock Facility Geotechnical Assessment

The WRF geotechnical assessment was reviewed by Okane to understand if there were any grading requirements for the WRF at closure to ensure its long term stability. Different factors of safety are required for WRFs during operation and at closure, as well as for global stability and surficial stability of WRFs. While the global stability analysis conducted (Golder, 2021) conservatively calculated a factor of safety of 1.54, which exceeds industry standard, there was not a surficial stability analysis completed on the surficial stability of the WRF slopes.

Long term surface stability factor of safety should exceed 1.1 to 1.2 (BC MWRPRC, 1991). Currently, the WRF is constructed at an overall slope angle of 2H:1V, with lifts placed at angle of repose, or approximately 1.36H:1V. At angle or repose, it is possible that the long term recommended factor of safety of 1.1 to 1.2 is not exceeded on the current geometry of the WRF, and that regrading of the slopes is needed to ensure long term stability.

4.2 Waste Rock management plan and non-conformances

The current closure plan for the WRF is to utilize NAG material as a cover system material and encapsulate PAG material in a minimum 50 m layer of NAG material at closure (BIM, 2018). Doing so will ensure that the active layer (the layer of material that will be exposed to freeze/thaw conditions each year) remains within NAG material, and that a frozen layer of NAG material is present to act as a barrier to entry for both oxygen and atmospheric water. The BIM waste rock management plan also includes requirements for placement of PAG material dependant on the atmospheric temperature at the time of placement to inhibit waste rock acting as an insulator for material placed below it.

The waste rock management plan was in large part followed in 2021 and 2022 with the two exceptions, as noted in BIM, 2022a, that are unlikely to have any long term environmental impact. However, BIM does not consider the criteria to only place PAG within 50 m of the outer face of the stockpile shell applicable at this point, as the current stockpile faces will continue to move outward as the stockpile increases (BIM, 2022a). Operationally, this is a reasonable statement, however it has lead to several instances where PAG rock was placed near, or at, the perimeter of the WRF (Figure 4.1) which in the event of an unplanned closure of the Mary River Mine would need to be encapsulated in NAG material.

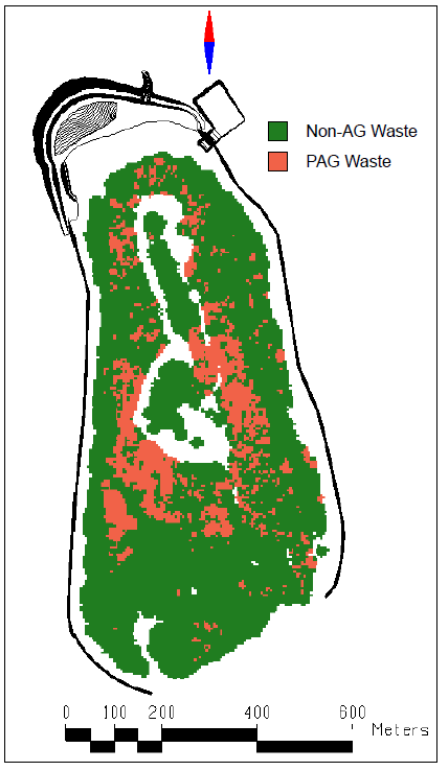


Figure 4.1: PAG and NAG Waste Locations within the WRF

BIM, 2022b

4.3 Water Quality Testing and Modelling Results

Water quality testing results from both the 570 sump at the active mining face and MS-08, the WRF catchment pond, were reviewed by Okane to investigate and inform on any potential long-term issues. While three of the four samples reviewed did not indicate any issues meeting water quality criteria, a sample collected from the 570 sump on August 26, 2023 (BIM, 2023) returned a pH of 4.74. This sampling period also coincided with a period of high precipitation on site, unlike the period when the other samples were collected, making it likely that the low pH observed in the 570 sump was due to acid rock drainage (ARD) from the exposed PAG pit walls being mobilized from increased rainfall. In addition to the low pH observed, water quality testing results also indicated elevated concentrations of nickel and Total Suspended Solids (TSS). Though long-term water quality modelling has not been completed, short term water quality modelling results also indicate elevated TSS and nickel concentrations and low pH levels (BIM, 2020).

4.4 Pit Wall Stabilization

Baffinland Iron Mines interim reclamation and closure plan (BIM, 2018) states that at closure, pit walls will be stabilized by active flooding of the open-pit to satisfy the closure objective of "Physically stable Open Pit Mine Workings...". The pit-lake would work to buttress pit walls for stability as well as inhibit oxygen

ingress to exposed PAG material. However, in the active mining areas current condition no pit-lake can be formed and cannot be until a pit is formed between Years 10-12 of operation (BIM, 2018). A stability analysis of the open pit is also planned by BIM, however, it has not yet been completed. It is possible that the current pit wall is not stable in the long-term. Additionally, to meet water quality objectives of the closure plan, it is also possible that exposed pit walls will require a cover system to inhibit oxygen ingress and the production of ARD products.

4.5 Waste Rock Facility Instrumentation

Instrumentation has been installed within WRF to monitor temperature (six locations), porewater pressure (two locations) and oxygen concentration (two locations). Oxygen concentration data has not been available since 2021, and porewater pressure monitoring indicates that the vibrating-wire piezometers are dry and in frozen ground (WSP, 2023).

Thermistors installed in the WRF to monitor temperature throughout the waste rock profile indicate the following (WSP, 2023):

- Overall, the WRF (at depth) has shown a freezing trend and remains frozen throughout the year.
- The active zone (the zone subject to freeze thaw effects) has been observed to extend between 2 – 3 m below the surface of the WRF.
- Evidence of internal heat generation has been observed within the WRF.

Overall, the thermistor data indicates that the mechanism of the freeze back cover system is effective, However, the presence of internal heat generation indicates PAG material placed within the WRF is subject to oxidation which can be indicative of long term water quality issues (WSP, 2023).

4.6 Geochemical Classification

Geochemical classification of waste rock at the Mary River site is done according to both sulfur content (>0.2% by weight is considered PAG) and by paste pH testing (<6 is considered PAG). Early estimates indicated only 10% of waste material at the Mary River site were expected to be classified as PAG material (BIM, 2018). However, based on 2022 quantities (BIM, 2022c) approximately 25% of waste rock material was classified as PAG material.

Additionally, several samples tested in the past (BIM, 2020) that were classified as NAG by BIM based on sulfur content (<0.2% by weight) would be classified as PAG by the Mine Environment Neutral Drainage (MEND) initiative.

Whether it is due to incorrect classification or inaccurate early estimates, larger than expected PAG quantities of waste rock could have implications on security due to complicating the waste rock deposition plan and to the necessity to address a large area of uncovered pit walls.

4.7 Equipment Inventory

Equipment inventory audit was performed in detail by a third party in 2021 (Ernst & Young, 2021) and tracked since using incoming and outgoing shipping manifests. The inventory audit was completed by splitting the Milne Port and Mary River into "functional locations" and then recording equipment by category such as "medium mobile equipment" or "component" according to International Standards Organization (ISO) guidelines. Table 4.1 shows the classifications used in the audit as well as equipment examples for each classification. BIM also utilizes SAP software to track equipment lists on site.

Table 4.1: Mobile and Mechanical Equipment Classifications

Classification	Equipment Example
Light Equipment	Pumps, fuel dispenser, laboratory equipment and sample bins
Medium Equipment	Aerodrome equipment, generators, shop/maintenance equipment, screens, and chutes
Heavy Equipment	Crusher, feeder, power plant generators, large screens, conveyors, and stackers
Light Mobile Equipment	Forklifts, pick ups, vehicles around five tonnes and under, scissor lift, man lifts, small bin trucks
Medium Mobile Equipment	Vehicles around 10 tonnes, trailers, buses, tow trucks, large garbage bins, water trucks
Heavy Mobile Equipment	Vehicles over 10 tonnes, boom trucks, large front-end loaders, dump trucks, graders and cranes

Ernst & Young, 2021

Ernst & Young found the following in their equipment inventory audit:

- Using the criteria from Table 4.1, 2,122 pieces of equipment was counted.
- 65% of the Equipment counted was positively identified.
- 42% of the SAP Equipment List met the criteria defined in Table 4.1
- 88 pieces of Equipment meeting Table 4.1 criteria were found on site but not in the SAP equipment list.
- BIM does not currently have an asset management policy implemented at the Mary River site.

- Accountability for equipment tracking is not specifically assigned to a BIM employee with authority to track equipment on site.

These findings indicate a relatively high level of uncertainty in the amount of equipment on site, as well as in how equipment is classified, which could have impacts on security.

4.8 Hazardous Waste Inventory

Hazardous waste reports are compiled and sent to QIA from both Milne Port and the Mine site storage areas. Inventory is separated by berm area and tracking of type of waste as well as quantity appear to be sufficient.

4.9 Stockpiles within the Active Mine area

BIM has stockpiled a total of approximately 4,700,000 tonnes of unscreened ore between stockpiles at 106 km and 109.5 km. It is Okane's understanding the purpose of the stockpiles is so BIM can continue hauling material in the event blasting can not be executed at the active mine face. While there are no major concerns with this practice as all material hauled as ore is considered NAG according to BIM's classification system, the stockpiles will need to be accounted for in the annual security estimate.

5 KEY FINDINGS

Okane's key findings from the site visit and desktop review include:

- BIM's waste rock management plan is largely being followed, however, PAG waste rock is currently being placed around the exterior of the WRF in anticipation of its footprint expanding. While this makes sense operationally, in the event of an unplanned closure it would be necessary to ensure 25 m of NAG rock is encapsulating all PAG rock to comply with the ICRP. This will have substantial implications on the annual security.

- The ICRP is not clear on BIMs plan for blasted rock slopes in an unplanned closure. The long-term plan of creating a pit-lake to provide stability does not apply to the site it is current state. While the ICRP does state that a stability assessment will be completed on pit walls to determine what will be done above the level of the pit-lake, that assessment has not yet been completed. In addition to the physical stability of the blasted rock slopes, the implications to water quality of leaving PAG material exposed is also unknown. This is a large source of uncertainty that can possibly have a substantial impact on closure costs.

- Long term water quality modelling has not been completed for runoff from the active mine area and contact water from the WRF. Currently, Metal and Diamond Mining Effluent Regulations (MDMER) criteria are exceeded at times in samples collected at MS-08, which receives runoff from both the active mine area (570 sump) and the WRF. Long term water quality modelling will help to inform on water treatment periods post-closure, which could have a substantial impact on security.

- Surface stability of the WRF slopes does not appear to have been evaluated. It is possible that the slopes must be graded to a more gradual slope than angle of repose for long term stability. The regrading of this volume of material would have a substantial impact on security.

- Based on the 2021 Equipment inventory audit, both the classification of equipment and quantity of overall equipment does not seem to be well understood by BIM. De-mobilization of equipment will account for a substantial cost at closure.

- Thermal modelling of the WRF has not been completed to understand the thermal regime within the WRF under future conditions, or under any climate change scenarios. This will be essential in understanding and ensuring the efficacy of BIMs planned cover system and could even result in a change in the thickness of the planned cover system which will be a large contributor to the overall security estimate.

6 RECOMMENDATIONS

Recommendations from Okane's 2023 Environmental Audit have been separated into two categories; recommendations that will help to eliminate uncertainty and better define closure and post-closure timelines for the purposes of the annual security estimate and general recommendations. General recommendations contribute to minimizing overall environmental impacts during operations of the Mary River Mine.

6.1 Security Estimate Implications

Okane recommends the following to eliminate sources of uncertainty in the annual security estimate:

- Thermal modelling of the WRF to better define the active zone and ensure the efficacy of BIM's planned cover system in the future and under climate change scenarios.
- Surface stability analysis of the WRF to determine whether or not regrading of the slope is necessary for long term stability.
- Long term water quality modelling of both the exposed pit wall runoff and WRF seepage and runoff to help understand the water treatment period post closure.
- Stability analysis of blasted pit walls which currently sit at a near vertical angle. It is possible long term-stability of blasted pit walls is not sufficient for those that will not be submerged in a pit-lake.
- Improved tracking and classification of equipment on site. Current classifications are not clear (ie. Medium mobile equipment is defined as weighing "around 10 tonnes").
- Whenever possible, place PAG waste rock material on the interior of the WRF, or plan to place a 25 m thick layer of NAG material directly after it.
- Install oxygen concentration sensors in the WRF to replace the sensors that have not been functional since 2021.

6.2 General Recommendations

Okane recommends the following to minimize the overall impacts on the environment during operation:

- Ensured exposed geosynthetics are covered with soil. Ultraviolet rays lead to accelerated deterioration of geosynthetic materials. Although it is likely that any issues will be addressed by the geotechnical monitoring and maintenance plan of containment berms, it may help to minimize maintenance efforts.

- Address uncontrolled seepage occurring from the landfill to the surrounding environment such as those from the WRF, crusher pad and landfill.
- Determine where/why uncontrolled seepage is coming from; below the ore crushing pad, adjacent to the KM106 stockpile, to the secondary containment area north of MS-08.
- Visually delineate areas on the WRF for PAG and NAG deposition to avoid material being placed in the wrong location.

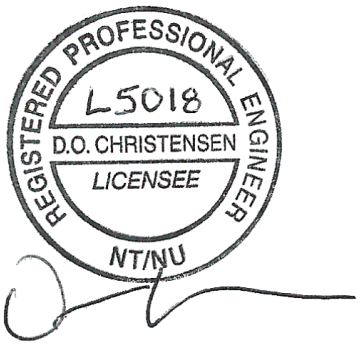
7 CLOSURE

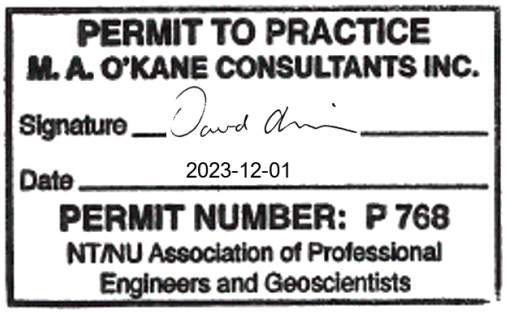
We trust information provided is satisfactory for your requirements. Please do not hesitate to contact the undersigned at 1 306 713 1779 for further information or questions.

Prepared by:

Travis Polkinghorne
Intermediate Engineer, Project Coordinator

Reviewed by:





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Appendix A

Information Request Correspondence

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Qikiqtani Inuit Association

ᑎᑎᕆᑲᑦᑯᓕᖅ P.O. Box 1340
ᐃᖅᑲᓗᐃᑦ, ᓄᓇᕗᑦ Iqaluit, Nunavut
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Serving the communities of

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Qikiqtarjuaq

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Resolute Bay

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Sanirajak

August 25, 2023

Elisabeth Luther
Senior Manager, Regulatory Affairs
Baffinland Iron Mines Corporation
2275 Upper Middle Road East, Suite 300, Oakville,
Ontario, Canada, L6H 0C3

RE: Information Request - 2023 Environmental Audit

Ms. Luther,

This Information Request is being issued by the Qikiqtani Inuit Association (QIA) to Baffinland Iron Mines Corporation (Baffinland) with respect to the 2023 Environmental Audit as per the QIA-Baffinland Commercial Lease No.: Q13C301 (Lease)[1]. This information is being collected in accordance with Schedule D and E of the Lease.

Table 1 provides a list of Information Requests. A response is requested by August 31, 2023 unless otherwise specified. QIA requests Baffinland include a status update of any items not provided by this date.

QIA thanks Baffinland for their cooperation. Should there be any questions, please feel free to contact the undersigned.

Sincerely,

Chris Spencer
Asst. Director, Lands & Resource Management

[1] QIA and Baffinland (2013). Commercial Lease No. Q13C301. September 6, 2013.

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Qikiqtani Inuit Association

ᑎᑎᖅᑲᓱᐊᕐᓂᖅ P.O. Box 1340
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Table 1: Information Request – 2023 Environmental Audit

ID	Information Request
1	Waste rock storage facility and cover system design documents as well as the waste rock management plan
2	KM 105 sedimentation pond berm design documents
3	Landfarm berm design documents, including previous and updated designs
4	Open pit design documents, as well as information pertaining to exposed geological strata
5	Milne Port ore stockpile as well as ROM stockpile design documents
6	Borrow reclamation material investigations
7	Site wide water management plan
8	Site water quality reports
9	As-built documentation of relevant site features

RE: QIA 2023 Environmental Audit - Information Request

Elisabeth Luther <Elisabeth.Luther@baffinland.com>

Wed 8/30/2023 1:38 PM

To:Chris Spencer <CSpencer@QIA.ca>
Cc:Connor Devereaux <Connor.Devereaux@baffinland.com>;Travis Polkinghorne <tpolkinghorne@okc-sk.com>;Dave Christensen <dchristensen@okc-sk.com>; Lou Kamermans <lou.kamermans@baffinland.com>

1 attachments (11 KB)

20230830-QIA Environmental Audit Information Requests.xlsx;

Hi Chris,

We have compiled all of the requested data. Please find attached the table with references (also copied below for quick reference).

I will shortly share two Kiteworks folder that contain all of the documents with all those copied on this email. Please let me know if anyone else should be included.

- 2023 – QIA Environmental Audit IR
- IFC-ASBUILT DIRECTORY

Connor will be able to provide additional information as needed throughout the audit.

Let us know if you need anything else.
Thanks,
Elisabeth

ID	Information Request	Reference
1	Waste rock storage facility and cover system design documents as well as the waste rock management plan	See attached plans: Life-of-Mine Waste Rock Management Plan, and Phase I Waste Rock Management Plan See Kiteworks folder IFC-ASBUILT DIRECTORY, As-Builts - Mine Site - Waste Rock Facility
2	KM 105 sedimentation pond berm design documents	See attached 2022 QIA and NWB Annual Report for Operations, Appendix C.1.2 CSR KM 105
3	Landfarm berm design documents, including previous and updated designs	See attached Notification of Construction for the Mine Site Landfarms and responses to comments from the NWB. See also 2022 QIA and NWB Annual Report for Operations, Appendix C.1.1 CSR Landfarm
4	Open pit design documents, as well as information pertaining to exposed geological strata	See attached plans: Interim Closure and Reclamation Plan, Life of Mine Waste Rock Management Plan Further information will be provided during the on-site portion of the audit.
5	Milne Port ore stockpile as well as ROM stockpile design documents	Milne Port ore Stockpile: See Kiteworks IFC-ASBUILT DIRECTORY - As-Builts-Milne Port ROM Stockpile: see Kiteworks folder IFC-ASBUILT DIRECTORY - IFCs-Mine Site-KM106 ROM
6	Borrow reclamation material investigations	See attached plan: Borrow Pit Management Plan Borrow pit materials not currently used for construction purposes.
7	Site wide water management plan	See attached plans: Surface Water and Aquatic Ecosystem Management Plan, Fresh Water Supply, Sewage and Wastewater Management Plan
8	Site water quality reports	See 2020-2022 QIA and NWB Annual Report for Operations
9	As-built documentation of relevant site features	See Kiteworks folder IFC-ASBUILT DIRECTORY

Elisabeth Luther | Senior Manager, Regulatory Affairs
Oakville Corporate Office
T: +1 416 364 8820 x5510
C: +1 647 382 3761
Elisabeth.Luther@baffinland.com

Baffinland

Attention: Head Office is Moving!
360 Oakville Place Drive, Suite 300, Oakville, Ontario, Canada, L6H 6K8

[www.baffinland.com]www.baffinland.com

From: Chris Spencer <CSpencer@QIA.ca>
Sent: August 25, 2023 12:06 PM
To: Elisabeth Luther <Elisabeth.Luther@baffinland.com>
Cc: Connor Devereaux <Connor.Devereaux@baffinland.com>; Travis Polkinghorne <tpolkinghorne@okc-sk.com>; Dave Christensen <dchristensen@okc-sk.com>
Subject: [EXTERNAL]QIA 2023 Environmental Audit - Information Request

Hi Elisabeth,

Please find attached 9 Information Requests for the upcoming 2023 Environmental Audit. Please let me know if further information is required to assist in the provision of the requested documentation. QIA is requesting that all information be provided before or on August 31, 2023.

Regards,
Chris

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Chris Spencer / Assistant Director, Lands and Resource Management
cspencer@qia.ca / 867.975.8448
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Qikiqtani Inuit Association
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Qikiqtani Inuit Association

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Sanirajak

September 11, 2023

Elisabeth Luther
Senior Manager, Regulatory Affairs
Baffinland Iron Mines Corporation
2275 Upper Middle Road East, Suite 300, Oakville,
Ontario, Canada, L6H 0C3

RE: 2nd Information Request - 2023 Environmental Audit

Ms. Luther,

This Information Request is being issued by the Qikiqtani Inuit Association (QIA) to Baffinland Iron Mines Corporation (Baffinland) with respect to the 2023 Environmental Audit as per the QIA-Baffinland Commercial Lease No.: Q13C301 (Lease)[1]. This information is being collected in accordance with Schedule D and E of the Lease.

Table 1 provides a list of Information Requests. A response is requested by September 22, 2023 unless otherwise specified. QIA requests Baffinland include a status update of any items not provided by this date.

QIA thanks Baffinland for their cooperation. Should there be any questions, please feel free to contact the undersigned.

Sincerely,

Chris Spencer
Asst. Director, Lands & Resource Management

[1] QIA and Baffinland (2013). Commercial Lease No. Q13C301. September 6, 2013.

ᑎᑎᖅᑲᒃᑯᕕᒃ P.O. Box 1340
ᐃᖃᓗᐃᑦ, ᓄᓇᕗᑦ Iqaluit, Nunavut
X0A 0H0

Table 1: 2nd Information Request – 2023 Environmental Audit

ID	Information Request
1	Geotechnical stability analysis of the WRF – operations and long-term stability
2	WRF thermistor reports – status of thermistors, summarized annual data
3	Documentation pertaining to occurrences when Waste Rock characterization and management plan could not be followed due to operational constraints and general location of PAG/NAG within the WRF
4	Waste rock characterization results – geochemical characterization of mine blocks and routine analysis results taken during operations
5	Long term prediction of WRF freezeback and active layer estimation (Thermal modelling results of WRF facility)
6	Water quality testing results of 570 Sump samples (or previous active mine area sump samples), secondary sediment pond beneath WRF sediment pond, seepage area below crusher pad and any documentation pertaining to influent treatment of the WRF water treatment plant.
7	Proposal(s), plans and report(s) on completed dye testing associated with collected seepage water in the secondary sediment pond beneath the WRF sediment pond and near the crusher pad
8	Inventory of all equipment on site including pickup trucks, haul trucks, generators, ore conveyors, excavators, dozers etc.
9	Inventory of hazardous waste on site
10	Current volume of 106 km ROM Stockpile, as well as in pit stockpiles on the 620 and 630 benches and any modifications to the existing water license associated with their presence
11	Reclamation plan for hilltop(s) blasted near airstrip
12	Long term surface water management plan of active mining area and WRF
13	Rehabilitation plan for active mining area in the event of an unplanned closure
14	Supporting information for security estimate unit rates - previous contractor quotes etc.
15	As built information of all buildings constructed on site – volumes for landfill estimates, dimension of concrete foundations.

Baffinland

September 22, 2023

Chris Spencer
Asst. Director, Lands & Resource Management
Qikiqtani Inuit Association
Iqaluit, NU X0A 0H0

Re: Baffinland Response to Qikiqtani Inuit Association's 2nd Information Request - 2023 Environmental Audit

The following submission from Baffinland Iron Mines Corporation (Baffinland) is a follow up in response to the Qikiqtani Inuit Association's (QIA) 2023 Environmental Audit Information Request. The attached Table 1 provides a summary of the QIA's audit information request. Baffinland has detailed responses to these items in Table 1.

Should you have any additional concerns or questions regarding the attached responses, please do not hesitate to contact the undersigned at your convenience.

Regards,

Elisabeth Luther
Senior Manager, Regulatory Affairs

Cc: Lou Kamermans, Tim Sewell, Connor Devereaux, Todd Swenson, Katie Babin, Steve Borcsok (Baffinland)

Attachments

Attachment 1 – Table 1: Baffinland Responses to QIA's 2023Environmental Audit – 2nd Information Request
Attachment 2 – List of Documents Uploaded to Kiteworks

Baffinland

Attachment 1

Baffinland Response to QIA's 2023 Environmental Audit – 2nd Information Request

Baffinland

Table 1: Baffinland Responses to QIA's 2023 Environmental Audit – 2nd Information Request

Cmt. #	Requested Action	Responsible Role	Baffinland's Response
1	Geotechnical stability analysis of the WRF – operations and long-term stability	Tech Services	The attached report titled "Geotechnical Review of Existing Waste Rock Facility, Mary River Mine, Baffin Island", prepared by WSP, provides the results of a desktop assessment of the Phase 3 WRF geotechnical design.
2	WRF thermistor reports – status of thermistors, summarized annual data	Tech Services	The attached report titled "22572750_002-Rev0 -TM_Reduced TM_27JUN23", provides a status update on all waste dump instrumentation, as of August 2022, in addition to a review and analysis of all data available at that time.
3	Documentation pertaining to occurrences when Waste Rock characterization and management plan could not be followed due to operational constraints and general location of PAG/NAG within the WRF	Tech Services	The attached report titled "QIA - Conformance to the PH1 WRMP Deposition Strategy" details our non-conformances for waste deposition in 2021 and 2022. The attached report titled "QIA - Non-AG & PAG Waste Dump Map" provides the location of PAG/NAG within the WRF.
4	Waste rock characterization results – geochemical characterization of mine blocks and routine analysis results taken during operations	Sustainable Development	A summary of the geochemical studies for the waste rock and Deposit No. 1 are provided in Section 9.6 and Appendix E.6 of the 2022 QIA-NWB Annual Report for Operations (NWB report provided with previous IR, item 8; Appendix E.6 attached).
5	Long term prediction of WRF freezeback and active layer estimation (Thermal modelling results of WRF facility)	Tech Services	This information is not currently available, and is expected to be available in early 2024.
6	Water quality testing results of 570 Sump samples (or previous active mine area sump samples), secondary sediment pond beneath WRF sediment pond, seepage area below crusher pad and any documentation pertaining to	Site Environment	Results from the 570 sump from June 25, 2023 and August 26, 2023 are attached. The pooling water beneath the WRF was pumped back into the WRF pond continuously and was observed to be empty prior to freeze up on September 4th. A sample was taken from the suspected seepage observed on July 12th and was determined to be not acutely toxic. As this water was being captured by the previously constructed berm and not flowing into the tundra, no subsequent sampling

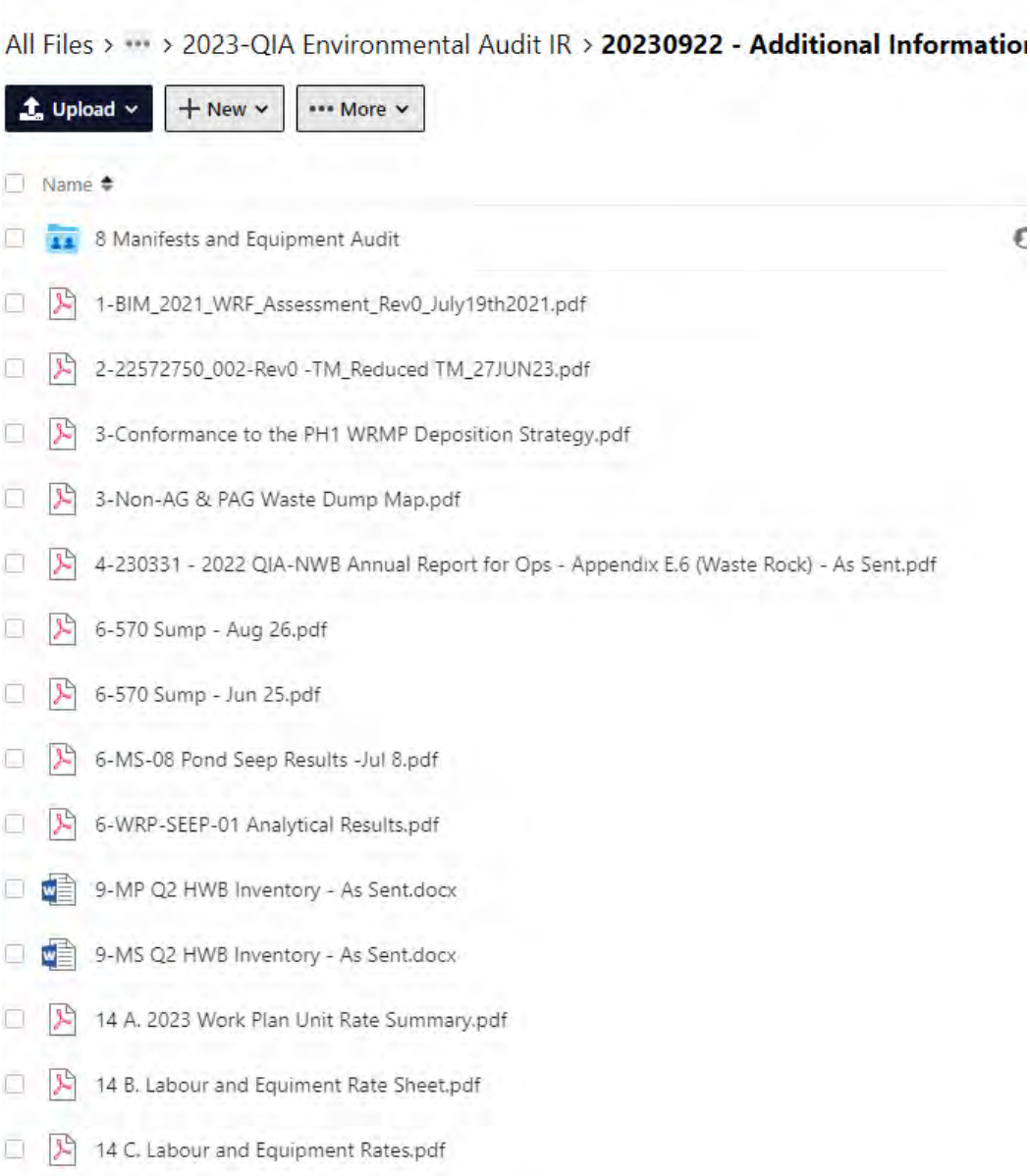
Cmt. #	Requested Action	Responsible Role	Baffinland's Response
	influent treatment of the WRF water treatment plant.		was conducted. Results are included the attached report titled WRP-SEEP-01 Analytical Results and more information provided in Item 7 below. The seepage area below crusher pad was observed. Seepage water observed during audit is suspected to be ground water. There is no indication this water is originating from crusher pad, as determined through extensive dye testing in 2020. A spill from the Crusher Ditch was reported on August 28th 2023 (NTNU-23-366) where water was observed to be leaking from the ditch on to the ground adjacent to the crusher pond. This water was sampled on August 28, and we are still waiting for the results from the analytical lab. Samples from the inflow at the WRF plant are provided in the attached report titled MS-08 Pond Results.
7	Proposal(s), plans and report(s) on completed dye testing associated with collected seepage water in the secondary sediment pond beneath the WRF sediment pond and near the crusher pad	Site Environment	During routine water sampling at the WRF, a seep was observed on July 11th. A sample was taken on July 12th. Sample was found to be not toxic. The water was observed to be pooling in the previously constructed diversion berm, and was subsequently pumped back into the WRF pond for treatment and discharge through the MS-08 FDP. After review of the rhodamine tracer dye testing that the water observed at the seepage location was at least partially coming from the WRF, either from the ditch or the pond itself. A full inspection was not able to be completed due to the water level in the pond. Investigation is ongoing and remedial measures will put in place as soon as possible. As mentioned above, results in relation to seepage at the WRF are attached: • WRP-SEEP-01 Analytical results • MS-08 Pond Seep Results – Jul 8 In regards to the crusher pad, as mentioned above it is not suspected that this is seepage from the pad.
8	Inventory of all equipment on site including pickup trucks, haul trucks,	Sustainable Development	A third-party Equipment Inventory Audit was completed at the Mary River Project in 2021. Changes in the equipment inventory in 2022 are reflected in sealift vessel manifests from that year. The 2023

Cmt. #	Requested Action	Responsible Role	Baffinland's Response
	generators, ore conveyors, excavators, dozers etc.		sealift season is currently underway and manifests will be provided once finalized following the completion of the sealift vessel transits for 2023. The 2021 Equipment Inventory Audit Report and sealift vessel manifests have been submitted previously to QIA and can be re-sent upon request.
9	Inventory of hazardous waste on site	Site Environment	Quarterly surveys of the hazardous waste inventory are shared with QIA. The most recent surveys are attached: • MP-Q2 HWB Inventory – As Sent • MS Q2 HWB Inventory – As Sent
10	Current volume of 106 km ROM Stockpile, as well as in pit stockpiles on the 620 and 630 benches and any modifications to the existing water license associated with their presence	Tech Services and Sustainable Development	On September 1, 2023, volumes of the 106 km ROM stockpile were: • MR Unscreened Lump 109.5km: 1,353,961 tonnes • MR Unscerened Lump 106km: 3,379,719 tonnes • Total: 4,733,680 tonnes The Design Brief and Issued for Construction Drawings (Notice of Construction) for the KM 106 ROM Stockpile were submitted to the Nunavut Water Board on June 24, 2019. Following Baffinland's responses to comments from QIA and CIRNAC, the Nunavut Water Board provided a letter advising their acceptance of the Notice of Construction on August 1, 2019. This Notice was submitted to comply with Part D, Item 2 of Water Licence No. 2AM-MRY1325, and was not a modification to the Water Licence. No modifications to the Water Licence are required for short-term storage of ore within the limits of Deposit 1.
11	Reclamation plan for hilltop(s) blasted near airstrip	Sustainable Development	As part of revegetation studies in 2024, Baffinland will assess the hilltops blasted near the Mary River airstrip to determine whether additional grading, recontouring, or other work would be necessary or beneficial for reclamation of these areas.
12	Long term surface water management plan of active mining area and WRF	Sustainable Development	See items submitted as part of the August 30th request (item 7 – Site Wide Water Management Plan) Surface water management at the mine site is described in Section 8 of the Surface Water and Aquatic Ecosystem Management Plan, and Section 8 of the Fresh Water Supply, Sewage and Wastewater Management Plan. Furthermore, information about monitoring of the Mine Site Waste Rock Facility

Cmt. #	Requested Action	Responsible Role	Baffinland's Response
			and Deposit No. 1 is provided in Sections 7.3.3 and 7.3.7 of the 2022 QIA-NWB Annual Report for Operations (provided with previous IR, item 8).
13	Rehabilitation plan for active mining area in the event of an unplanned closure	Sustainable Development	Closure plans in the event of a temporary closure of the site are presented in Section 7 of Baffinland's Interim Closure and Reclamation Plan (ICRP, BAF-PH1-830-P16-0012). Closure plans for permanent closure are presented in Section 5 of the ICRP. In Revision 2 of the 2022 Marginal Closure and Reclamation Financial Security Estimate (June 2022), Baffinland allocates security to account for the construction of a 300m long drainage channel to account for the free drainage of the Deposit 1 area prior to a pit being developed at Deposit 1. This channel would only be constructed in a long-term closure scenario occurring prior to a pit being developed at Deposit 1.
14	Supporting information for security estimate unit rates - previous contractor quotes etc.	Sustainable Development	A summary of unit rates and copies of contractor unit rate sheets used for the unit rate update provided in Baffinland's 2023 Marginal Security Estimate are provided in Attachment. Baffinland is currently working with Stantec to review the security estimate unit rates, and looks forward to additional discussions and information sharing on unit rates during meetings with QIA scheduled for October 2023.
15	As built information of all buildings constructed on site – volumes for landfill estimates, dimension of concrete foundations.	Sustainable Development	Baffinland will update the Kiteworks IFC/As-Built Drawing Directory to include all available as-built information by November 1, 2023.

Baffinland

Attachment 2
List of Documents Uploaded to Kiteworks



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Qikiqtani Inuit Association

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Sanirajak

October 17, 2023

Elisabeth Luther
Senior Manager, Regulatory Affairs
Baffinland Iron Mines Corporation
2275 Upper Middle Road East, Suite 300, Oakville,
Ontario, Canada, L6H 0C3

RE: 3rd Information Request - 2023 Environmental Audit

Ms. Luther,

This Information Request is being issued by the Qikiqtani Inuit Association (QIA) to Baffinland Iron Mines Corporation (Baffinland) with respect to the 2023 Environmental Audit as per the QIA-Baffinland Commercial Lease No.: Q13C301 (Lease)[1]. This information is being collected in accordance with Schedule D and E of the Lease.

Table 1 provides a list of Information Requests. A response is requested by November 3, 2023 unless otherwise specified. QIA requests Baffinland include a status update of any items not provided by this date.

QIA thanks Baffinland for their cooperation. Should there be any questions, please feel free to contact the undersigned.

Sincerely,

Chris Spencer
Asst. Director, Lands & Resource Management

[1] QIA and Baffinland (2013). Commercial Lease No. Q13C301. September 6, 2013.

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Table 1: 3rd Information Request – 2023 Environmental Audit

ID	Information Request
1	Surface stability analysis of the Waste Rock Facility
2	Stability assessment of current pit-walls in the active mining area
3	Long term water quality modelling reports beyond 5 years
4	Justification of waste rock samples classified as NAG, despite some waste rock having a net neutralization potential ratio of less than 2, which would classify them as PAG using Mine Environment Neutral Drainage (MEND) guidelines

November 2, 2023

Chris Spencer
Assistant Director, Lands and Resource Management
Qikiqtani Inuit Association
Iqaluit, NU X0A 0H0

Re: Third Information Request - September 2023 Environmental Audit

The following submission from Baffinland Iron Mines Corporation (Baffinland) is a follow up in response to the Qikiqtani Inuit Association's (QIA) 2023 Environmental Audit Information Request. The attached Table 1 provides a summary of the QIA's Audit information request. Baffinland has detailed responses to these items in Table 1.

Should you have any additional concerns or questions regarding the attached responses, please do not hesitate to contact the undersigned at your convenience.

Regards,

Elisabeth Luther,
Senior Manager Regulatory Affairs

Cc: Lou Kamermans, Tim Sewell, Connor Devereaux, Todd Swenson, Katie Babin (Baffinland)

Attachments

Attachment 1 – Table 1: Baffinland Responses to QIA's 2023 Environmental Audit – Third Information Request

Baffinland

Attachment 1

Baffinland Response to QIA's 2023 Environmental Audit – Third Information Request

Table 1: Baffinland Responses to QIA's 2023 Environmental Inspection – Third Information Request

Cmt. #	Information Request	Baffinland's Response
1	Surface stability analysis of the Waste Rock Facility	There are no major geotechnical concerns to note at the Waste Rock Facility (WRF) and no incidents to date in 2023. The current operational, monitoring and management practices as described in the Waste Rock Management Plan (WRMP) and Ground Control Management Plan (GCMP) have been sufficient to mitigate and address minor issues that might occur as part of regular waste rock deposition activities. Management of potentially acid generating rock (PAG) has continued to occur following the WRMP with no major concerns to note at this time. In August 2022, Knight Piesold (KP) completed a third-party inspection. Waste rock deposition has continued following the same interim dump design as in 2022 and no specific concerns have arisen since the last review. BIM completes regular drone flights of the WRF to monitor for geotechnical concerns and track material deposition. No material stability concerns were identified as part of this process or as part of regular inspections completed by Mine Operations and/or Technical Services staff. As of Q3 2023, BIM now has two dedicated geotechnical staff as part of the larger Technical Services Team. These two members will be responsible for overseeing the implementation of the GCMP, installation and maintenance of monitoring equipment, and the inspection of walls, stockpiles and waste rock facilities.
2	Stability assessment of current pit-walls in the active mining area	There are no major geotechnical concerns to note in the active mining areas and no reportable rockfall incidents to date in 2023. The current operational, monitoring and management practices as described in the Ground Control Management Plan (GCMP) have been sufficient to mitigate and address minor issues that might occur as part of regular mining activities. In August 2022, KP completed a third-party site inspection. No specific geotechnical concerns were noted. A detailed drone flight of the Nuluujaak pit was completed by Hatch in July 2023, and this will be evaluated to identify any significant changes since the August 2022 site inspection. As of Q3 2023, BIM has two dedicated geotechnical staff as part of the larger Technical Services Team. These two members will be responsible for overseeing the implementation of the GCMP, installation and maintenance of monitoring equipment, and the inspection of walls, stockpiles and waste rock facilities.

Cmt. #	Information Request	Baffinland's Response
3	Long term water quality modelling reports beyond 5 years	The original EIS made predictions on water quality at closure. Baffinland is currently in the process of updating the water quality model as a study to inform the next revision of the Phase 1 Waste Rock Management Plan. This uses the latest site-specific data that is currently available.
4	Justification of waste rock samples classified as NAG, despite some waste rock having a net neutralization potential ratio of less than 2, which would classify them as PAG using Mine Environment Neutral Drainage (MEND) guidelines	Within Baffinland's Phase 1 Waste Rock Management Plan, Appendix A1, Page 8, the following is stated: "*Thirty-eight samples had NPR values greater than 2 and are classified as non-potentially acid generating (Non-AG). 21 samples had NPR values between 1 and 2 and are classified as "uncertain" (i.e., having unknown acid generation potential). 10 samples had NPR values less than 1 and are therefore classified as potentially acid generating (PAG). 17 samples including; 13 samples classified as uncertain and four of the samples classified as PAG based on NPR values, would be considered Non-AG based on the current waste rock segregation criteria*." Commenting on the above paragraph, QIA requested "*Justification of waste rock samples classified as NAG, despite some waste rock having a net neutralization potential ratio of less than 2, which would classify them as PAG using Mine Environment Neutral Drainage (MEND) guidelines*." To clarify, the geochemical assessment in Appendix A1, Page 8, is based on waste rock segregation criteria that was in place at the time the report was written. Importantly, a recommendation from this same report was to implement paste pH testing as part of the waste rock segregation criteria, where any sample with sulphur > 0.2 wt.% or paste pH < 6 would be classified as PAG. This added screening criteria reduces the probability of classifying material as NAG when sulphur content is low, but there is still potential to release stored acidity. This updated criteria is currently being used by Baffinland. Furthermore, the assessment in Appendix A1, Page 8, is based on samples that were purposely selected to have sulphur values close to 0.2%, and as such, the percent of samples classified as NAG that had NPR values < 1 (i.e. "PAG" according to MEND 2009) or between 1 and 2 (i.e. "Uncertain" according to MEND 2009), will be skewed when compared to total waste mined. The original justification for using > 0.2% total sulphur to define waste as PAG comes from an analysis completed on 776 drill core samples collected from across Deposit 1, where it was determined that a very small percentage of samples (0.1%) had sulphur > 0.2% and NPR ≤ 2. Notably, Baffinland has been sending select production blasthole samples off-site for ABA and SFE analysis since 2020, on a regular basis, with purpose to develop a comprehensive geochemical database of mined waste rock that would allow for the potential refinement of waste rock segregation criteria, if required in the future. A review of this dataset, and in particular, the relationship between % sulphur and NPR, is underway, and the results of this analysis will be provided in the next update to the Phase 1 Waste Rock Management Plan.

Appendix B

Documents Reviewed

Table.B.1: Documents Reviewed during the 2023 Environmental Audit

Document Name	Description
BIM-5200-PLA-0029-Phase 1 Waste Rock Management Plan	Waste Rock Management deposition plan for Phase 1 of the project
BIM-5200-PLA-0030-Life-of-Mine-Waste Rock Management Plan	Waste Rock Management plan for life of Mary River Mine
2022-QIA-NWB-Annual Report for Ops	2022 BIM annual operations report
20200617_Notification of Construction_Mine Site Landfarm IFCs_AsSent	Issued for construction drawings of mine site landfarm
BIM-5200-PLA-Borrow Pit and Quarry Management Plan	Borrow pit and quarry management plan
BIM-5200-PLA-Surface Water and Aquatic Ecosystem Management Plan	Surface water and aquatic ecosystem management plan
BIM-5200-PLA-0022-Fresh Water Supply, Sewage and Wastewater Management Plan	Fresh water supply, sewage and waste water management plan
BIM_2021_WRF Assessment_Rev0_July19th2021	Waste rock facility geotechnical assessment
Non-AG & PAG Waste Dump Map	Map showing locations of Non-AG and PAG within the waste rock facility
MS-08 Pond Seep Results – Jul 8	Water quality testing results for MS-08 sample collected July 8, 2023
570 sump – Jun 25	Water quality testing results for 570 sump collected June 25, 2023
570 sump – Aug 26	Water quality testing results for 570 sump collected August 26, 2023
WRP – SEEP – 01 Analytical Results	Water quality testing results from MS-08
MP Q2 HWB Inventory	Hazardous waste inventory for quarter 2 of 2023
Baffinland Equipment Inventory Audit – Report- Draft v02	Equipment inventory audit conducted in 2021
2022 Consolidated Northbound Manifests	2022 consolidated shipping manifests for northbound shipments
2022 Consolidated Southbound Manifests	2022 consolidated shipping manifests for southbound shipments
22572750_Rev0-TM_Reduced TM_27June23	Assessment of instrumentation data and the thermal regime of waste rock storage facility at the Mary River Mine
Conformance to the PH1 Deposition Strategy	Description of areas of non conformance to the waste rock deposition plan.