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Baffinland Iron Mines Corporation

ROADS MANAGEMENT PLAN

BAF-PH1-830-P16-0023

FOR REVIEW PURPOSES ONLY

Rev

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1 INTRODUCTION

This Roads Management Plan (RMP) describes Baffinland Iron Mines Corporation's (Baffinland's) framework for effective construction, operation and maintenance of roads associated with the Mary River Project (the Project).

1.1 PURPOSE AND SCOPE

This Plan has been developed to ensure the protection of people, wildlife and the environment by managing Project roads consistent with applicable best practices, permits, authorizations, approvals and Inuit Knowledge. This Plan is applicable to all roads that comprise the Project road network, including:

- Service roads at Milne Port
- The road between Milne Port and the Mine Site, known as the Milne Inlet Tote Road (Tote Road)
- Service roads at the Mine Site, including the Mine Haul Road (MHR)

Environmental issues that are common to other elements of the Project also pertain to the construction, operation and maintenance of roads. As such, this Plan presents operational procedures for road operation, and connects links to other plans, procedures and policies that present relevant mitigation measures or monitoring programs that encompass Project roads. Relevant plans, procedures and policies are identified and described in Section 1.2.

This Plan applies to all personnel and equipment working for or on-behalf of Baffinland, including Contractors and Sub-contractors (herein identified as "Contractors"). Roles and responsibilities are described in the Plan.

All railway references throughout this document are not applicable to the northern railway operation that was relevant to the Phase 2 Proposal. Railway references have been kept in this document to address the southern railway, which is applicable to the current approved Project, but is not being constructed at this time.

1.2 RELATIONSHIP TO OTHER MANAGEMENT PLANS


The construction, operation, and maintenance of the Project road network may affect air quality, vegetation, wildlife, water quality, fish habitat and other land users. Therefore, the mitigation of effects from roads and the monitoring of these effects are addressed by the plans, procedures and policies identified in Table 1.1. The Roads Management Plan is an area/activity management plan, and as such, relies on the implementation of these other discipline-specific management plans in terms of mitigation, monitoring and reporting.

TABLE 1.1 RELATIONSHIP TO OTHER MANAGEMENT PLANS

Area/Activity	Referenced Management Plan/Procedure/Policy	Document No.	Information Provided by Referenced Plan(s)
Aggregate Extraction	Borrow Pits and Quarry Management Plan	BAF-PH1-830-P16-0004	General mitigation measures related to the development and operation quarries and borrow pits, and requirements for borrow pit and quarry-specific management plans.
	Milne Inlet Tote Road Quarry and Borrow Source Management Plan	BAF-PH1-830-P16-0048	Mitigation measures associated with roadside borrowing and quarrying activities (i.e. cut-and-fill) along the Tote Road.

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Area/Activity	Referenced Management Plan/Procedure/Policy	Document No.	Information Provided by Referenced Plan(s)
Archaeology	Cultural Heritage Resource Protection Plan	BAF-PH1-830-P16-0006	Describes the measures to protect cultural heritage features, including chance finds.
	Chance Finds Procedure	In the Environmental Protection Plan	Detailed actions to be taken if a suspected archaeological site is identified.
Various Activities	Environmental Protection Plan (EPP)	BAF-PH1-830-P16-0008	Provides relevant environmental protection measures.
Land Use / Public Safety	Hunter Site Access Procedure (to be replaced with Controlled Access Policy)	BAF-PH1-830-PRO-0002	Procedures for transporting land users up and down the road
	Cultural, Resources and Land Use (CRLU) Monitoring Program	Proposed	Monitoring land uses and Project impacts on Inuit land use and harvesting.
Dust	Air Quality and Noise Abatement Management Plan (dustfall monitoring)	BAF-PH1-830-P16-0002	Mitigation measures for dust (Dust Management Protocol) and dustfall monitoring program.
Erosion and Sediment Control	Surface Water and Aquatic Ecosystems Management Plan (SWAEMP)	BAF-PH1-830-P16-0026	Identifies the management strategies and general mitigation measures related to controlling sedimentation and erosion effects on aquatic ecosystems, and monitoring programs focused on the local aquatic environment.
Snow Management	Snow Management Plan	BAF-PH1-830-P16-0023	Includes operational protocols and plans developed to manage freshet's high flows and mitigate freshet's potential negative impacts on surface water quality and associated infrastructure.
Combined Aquatic Effects	Aquatic Effects Monitoring Plan (AEMP)	BAF-PH1-830-P16-0039	Aquatic effects monitoring that may detect road-related impacts from dust, sedimentation and water use to the aquatic environment within the Mine Site area.
Water Use	Fresh Water Supply, Sewage and Wastewater Management Plan (FWSSWMP)	BAF-PH1-830-P16-0010	Details on water withdrawal sites for dust suppression.
Wildlife	Terrestrial Environmental Management and Monitoring Plan (TEMMP)	BAF-PH1-830-P16-0027	Describes mitigation and monitoring related to wildlife, including the caribou decision tree and monitoring programs.
Emergencies	Emergency Response Plan (ERP)	BAF-PH1-830-P16-0007	Describes the process for responding to emergencies.
	Spill Contingency Plan (SCP)	BAF-PH1-830-P16-0036	Describes response measures associated with spills including sediment releases.

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Area/Activity	Referenced Management Plan/Procedure/Policy	Document No.	Information Provided by Referenced Plan(s)
Closure	Interim Closure and Reclamation Plan (ICRP)	BAF-PH1-830-P16-0012	Addresses closure measures and closure/post-closure monitoring requirements related to the road.

1.3 CORPORATE POLICIES

Baffinland has four corporate policies that apply to this management plan:

- **Sustainable Development (SD) Policy** - identifies Baffinland's commitment internally and to the public to operate in a manner that is environmentally responsible, safe, fiscally responsible and respectful of the cultural values and legal rights of Inuit.
- **Health, Safety and Environment (HSE) Policy** - describes the company's commitment to achieve a safe, healthy and environmentally responsible workplace.

All employees and contractors must comply with the above mentioned policies. Copies of the first two plans are included in Appendix A.

Another corporate policy relevant to the Tote Road is a Controlled Access Policy that will be developed regarding joint use of the road by Inuit hunters (Section 1.1).

1.4 REGULATORY REQUIREMENTS

This Plan outlines the Project's policies and procedures to ensure compliance with the relevant terms, conditions and regulations outlined in the following regulatory instruments:

- Type A Water Licence No. 2AM-MRY1325 issued by the Nunavut Water Board (NWB or the Board)
- Commercial Lease - Q13C301 (Commercial Lease) with the Qikiqtani Inuit Association (QIA)
- Project Certificate No. 005 issued by the Nunavut Impact Review Board (NIRB)
- *Fisheries Act* Authorization No. NU-06-0084 (DFO, 2007), and subsequent amendments applicable to fish-bearing water crossings along the Tote Road


Tables of concordance with the first three of these regulatory approvals are provided in Appendix B. Compliance to the terms and conditions included in the Tote Road *Fisheries Act* Authorization is documented in an annual report submitted to DFO each year.

The following legislation place specific requirements on the Project with respect to the operation and maintenance of Project roads:

- *Territorial Lands Act* and Territorial Land Use Regulations
- *Nunavut Waters and Nunavut Surface Rights Tribunal Act*
- *Canadian Environmental Protection Act*
- *Safety Act and Occupational Health and Safety Regulations*
- *Fisheries Act*


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- *Mine Health and Safety Act* and Regulations

Requirements and regulations outlined in the *Mine Health and Safety Act* and Regulations will be addressed in the Project's Civil Design Criteria document (Hatch, 2013), and subsequent amendments.

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2 PLANNING

2.1 OBJECTIVES

The overall goal of this Plan is to set the framework for gathering the information necessary to prevent or avoid adverse environmental effects from the Project and identify need for additional mitigation measures, if necessary. The objectives and performance indicators used to meet this goal are identified in Table 2.1.

TABLE 2.1 OBJECTIVES AND PERFORMANCE INDICATORS

Objective	Performance Indicator(s)
Mitigate potential impacts to water and protect aquatic ecosystems	Water quality <ul style="list-style-type: none"> Total suspended solids (TSS) and turbidity
Minimize fugitive dust emissions	<ul style="list-style-type: none"> Monthly and Annual Dustfall
Minimize impacts on land use and harvesting	<ul style="list-style-type: none"> Inuit Land Use and Harvesting Success (to be determined in CRLU monitoring program)
Protect the health and safety of workers and other land users	<ul style="list-style-type: none"> Reported OHS Incidents involving workers and other land users.
Minimize the effect of roads snow management on caribou movement	<ul style="list-style-type: none"> Snowbank height
Inuit objectives TBD	<ul style="list-style-type: none"> The development of Inuit indicators will be jointly developed by Baffinland and the QIA.

Baffinland and the QIA are jointly implementing an adaptive management process into management plans developed for the Project (Section 2.3), and this includes the development of Inuit objectives and indicators, as noted in Table 2.1.

Monitoring plans and applicable thresholds are described in Section 5.

2.2 CONSIDERATION OF INUIT QAUJIMAJATUQANGIT AND LOCAL KNOWLEDGE


Baffinland views Inuit Qaujimaajatuqangit as central to the successful planning and operation of the Project. IQ is reflective of the Inuit knowledge transferred from generation to generation and captures knowledge of relationships and morality, core values and worldviews, as well as environmental knowledge. As identified in the Mary River Project Inuit Impact and Benefit Agreement (IIBA), IQ is beneficial for the Project and provides critical insights into the environmental, ecological, cultural and socioeconomic dimensions of the Project.

Given the importance of IQ, Baffinland developed an IQ Framework to guide its integration and use. The IQ Framework supports collaboration and decision-making throughout the life of the Project and is not limited to the approach or methods associated with an individual IQ study. The purpose of the IQ Framework is to identify procedures and provide guidance on the following;

- The processes through which IQ can be shared with Baffinland

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- Schedule and timing for gathering and integration of IQ
- Roles and responsibilities of parties involved
- Processes and mechanisms through which IQ informs Project related decision-making

The IQ Framework also defines commonly used terms to support communication between parties and identifies the relationship between the IQ Framework and other management and monitoring plans, including the QIA's Inuit Stewardship Plan. For a greater understanding of the Projects general approach towards consideration of IQ, please refer to the IQ Framework.

In addition to the general pathways that IQ has and will inform this Plan, there are several initiatives with specific relevance to this Plan worth noting here:

- **Annual Dust Audit.** The Annual Dust Audit, as required by Term and Condition 187 of the Project Certificate is supported by a Dust Audit Committee, comprised of representatives from each of the five (5) North Baffin communities. The Dust Audit Committee supports an annual audit of dust mitigation and monitoring across the Project, and drives recommendations that are submitted to Baffinland on an annual basis. These recommendations, as adopted have been and will be integrated into this Plan.
- **North Baffin Hunters and Trappers Organizations membership in the Terrestrial Environment Working Group.** Baffinland has agreed to resource the participation of 2 members of the MHTO and 1 member from each of the 4 remaining North Baffin HTO's in the Terrestrial Environment Working Group, where dust and caribou management are discussed as a standard agenda component.
- **Project Certificate 005, Appendix B Commitments.** Baffinland and QIA agreed to several commitments aimed at increasing the role of IQ in dust monitoring and mitigation. These include commitments by Baffinland to
 - resource and annual snowpack sampling and monitoring through the Inuit led dust monitoring program
 - resource the development of a snow quality metric, integrating traditional knowledge, as part of the development of Inuit OITRs related to dust.
 - resource a study of North Baffin caribou based on Inuit Qaujimjatuqangit, to be led by the QIA in conjunction with HTOs
 - implement additional mitigation measures within interim Project Protection Zones, to be delineated and agreed by Baffinland and QIA (with input from the TEWG) based on existing IQ, western science, historical data, and project monitoring to date
 - Jointly approve with the QIA the adaptive management components of this Plan that relate to dust through a bilateral Adaptive Management Plan Working Group

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2.3 PRINCIPLES OF ADAPTIVE MANAGEMENT

Adaptive management is a planned and systematic process for continuously improving environmental management practices by learning about their outcomes. Adaptive management provides flexibility to identify and implement new mitigation measures or to modify existing ones during the life of a project.

Adaptive strategies are implemented when unanticipated adverse effects are observed, or if effects exceed identified thresholds. The management and mitigation of unanticipated adverse effects are most effective when collaboration between Baffinland, local stakeholders and regulators is employed. If effects to the atmospheric environment exceed identified thresholds, Baffinland will implement a corresponding response as contained within the Trigger Action Response Plan (TARP; Section 5), or a reasonable alternative.

2.3.1 DEFINING THE ADAPTIVE MANAGEMENT PROCESS

Baffinland has developed a draft Adaptive Management Plan (AMP) that provides the framework by which adaptive management is to be incorporated into Project operations (Baffinland, 2022b). The Project-wide adaptive management process begins with a planning phase, followed by iterative phases of implementing and monitoring the actions included in the plan(s), evaluating the effectiveness of actions included in the plans based on results of monitoring and other feedback mechanisms, and adjusting management strategies and actions and responses based on monitoring. The cycle begins anew with implementation and monitoring of a revised plan, which integrates the outcomes of the previous cycle. This cycle can occur, in real-time or over an extended period according to the nature of the situation or area of focus. In this way, a properly designed and well-implemented adaptive management process progressively diminishes uncertainty, as management strategies and processes are refined throughout a project's operational lifecycle.

Monitoring and responding to effects in the short-term is addressed in a Trigger Action Response Plan (TARP) described in Section 5. The TARP identifies the pre-defined actions to be taken should threshold levels be exceeded. A series of escalated actions to be implemented are detailed in Section 5. Longer term review of and response to monitoring data is addressed in an annual review of plan effectiveness in Section 6. The latter includes an annual comparison of project effects against impact predictions made in the Final Environmental Impact Statement (FEIS; Baffinland, 2012) and the addendums (Baffinland 2013, 2018, 2020, 2022a).

Implementation of the AMP will be informed by a Baffinland-QIA Adaptive Management Working Group. Ongoing inputs from the sources described in Section 2.2 above as well as Baffinland's ongoing project monitoring will also form the basis of amendments and refinements to the objectives, indicators, thresholds, and response requirements over time.


2.3.2 ADAPTIVE MANAGEMENT CHECKLIST FOR ENVIRONMENTAL MANAGEMENT

Table 2.3 presents an adaptive management checklist developed for the Roads Management Plan, identifying how adaptive management has been incorporated into the current revision of the Plan.

TABLE 2.2 ADAPTIVE MANAGEMENT IN THE ROADS MANAGEMENT PLAN

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Adaptive Management Phases	Components	Proposed Adaptive Management Mechanisms	Status of Management Plan
Plan	Objectives	Are objectives clear and key desired outcomes defined?	In Progress Objectives are presented in Section 2.1.
	Indicators	Are performance indicators adequately identified?	In Progress Performance indicators are presented in Sections 2.1 and 5.1.
	Identification of Thresholds	Are thresholds for specific responses identified (e.g., early warning triggers, action levels, quantitative metrics or qualitative descriptions)?	In Progress Thresholds are identified in Section 5.1.
	IQ Integration / Influence	Are mechanisms for IQ integration/influence identified?	In Progress

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Adaptive Management Phases	Components	Proposed Adaptive Management Mechanisms	Status of Management Plan
Implement and Monitor	Management Strategies and Responses	Are management strategies and response options clearly identified?	<u>In Progress</u> Management strategies are described in Section 3. Threshold Action Response Plans are presented in Section 5.1.
	Resourcing	Are all phases of the adaptive management cycle properly resourced (in accordance with Inuit Agreements) to be fully implemented?	<u>In Progress</u>
Implement and Monitor	Monitoring	Does the monitoring program provide the information needed to determine the effectiveness of management strategies and responses?	<u>In Progress</u> Section 5 presents Baffinland-led monitoring activities related to roads management.
	Timeline for implementation	Is the possibility that rapid response may be necessary, considered in the implementation plan/process?	<u>In Progress</u> Trigger action response plans (TARPs) have been developed for key project activities (Table 5.1). This includes the identification of low, moderate, and high action responses that correspond to low, moderate, and high-risk conditions.
Evaluate and Learn	Review Data and Feedback	Is the process for reviewing and evaluating management effectiveness (based on monitoring data and feedback) articulated?	Partially, further detail including adaptive management-related roles and responsibilities, reporting structures, and applicable response action forms need to be developed.
	Additional Mitigation	Are mechanisms for determining the need for additional mitigation described?	<u>In Progress</u> Table 5.1 identifies actions to be undertaken according to various triggers. Need for additional mitigation is determined based on results of monitoring programs described in Section 5.
	Input of IQ Holders	Are opportunities identified for IQ holders to review results and provide input into adaptive management responses / mitigations?	<u>In Progress</u>

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Adaptive Management Phases	Components	Proposed Adaptive Management Mechanisms	Status of Management Plan
Adjust	Unanticipated Effects or Issues	Is it apparent how unanticipated effects or issues will be actioned and resolved?	<u>Pending Approval</u> Section 6 (Figure 6.1 in particular) describes the process for incorporating repeat non-compliance and unanticipated effects into future updates.
	Reporting	Are reporting mechanisms for new / revised strategies and response actions established?	<u>Pending Approval</u> Section 6 describes the process for reporting mechanisms for new / revised strategies. A review schedule of the plan is provided in Table 6.1.
	Scheduled Updates	Is the frequency of scheduled updates to the management plan identified?	A review of the plan is provided in Table 6.1.

Implementation of adaptive management will be an iterative process; not all elements have been addressed in the current plan. These will evolve through ongoing engagement as described in Section 3.

2.4 DESIGN OF PROJECT ROADS AND WATER CROSSINGS

Project roads and water crossings have been designed and constructed as outlined in the Project's Civil Design Philosophy (Hatch, 2018), and subsequent amendments, and complies with applicable federal and local laws and regulations. In general, the wearing surface of the roads is designed based on the loads from the specific design vehicle for the road and is profiled to drain water from the surface to appropriately designed swales or drainage pathways adjacent to the road.

2.5 REGULATORY APPROVALS FOR CHANGES TO PROJECT ROADS AND WATER CROSSINGS

Within the Commercial Lease, Type 'A' Water Licence and *Fisheries Act* there are multiple terms and conditions that must be considered when making changes to Project roads and/or water crossings.


2.5.1 COMMERCIAL LEASE

Under Section 2.8 of the Commercial Lease, adjustments to the Tote Road require approval from the QIA (landowner). Activities that constitute a 'Tote Road adjustment' are defined in the Tote Road Adjustment Notification (TRAN) process provided in Appendix C of this plan. In summary, Baffinland must submit a TRAN application to the QIA for approval for changes to the Tote Road that meet one or more of the following criteria:

- Are-alignment of the Tote Road where the centre line of the road is moved >10 m from the existing centre line
- Addition of another lane to the Tote Road
- Raising the existing grade of the Tote Road by >2 m in elevation

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- Lowering the existing grade of the Tote Road in areas that have historically been prone to permafrost degradation
 - Areas along the Tote Road that have historically been prone to permafrost degradation as a result of cuts and the lowering of road grade are outlined in Table 3.1. When lowering the existing grade of the Tote Road within these areas (Table 2.4), the potential impact on permafrost will be evaluated and where the potential for degradation exists, the submission of a TRAN will be required.
- Lowering the existing grade of the Tote Road by >1 m in areas not identified in Table 2.4
- Changing the design of an existing bridge or culvert. Upgrading an existing bridge or culvert to the approved design (e.g. Issued-for-Construction (IFC) drawings included in the Early Revenue Phase (ERP) approvals) will not require the submission of a TRAN
- A re-alignment of the Tote Road that results in the placement of material within 31 metres of the High Water Mark of a natural water body

TABLE 2.3 PERMAFROST SENSITIVE AREAS ALONG THE TOTE ROAD

Tote Road Areas requiring a Permafrost Assessment for Work involving Cuts and/or Lowering of Road Grade
Km 50 - 64
Km 70 - 100


For the purposes of defining a ‘Tote Road adjustment’ under the Commercial Lease, the Tote Road is defined as the main transport corridor starting at approx. Km 2.5 (N 71° 52’ 02.3” W 80° 52’ 51.1”) near Milne Port and terminating at Km 100 (N 71° 19’ 44.3” W 79° 22’ 24.6”) near the Mine Site. Activities that do not meet one or more of the criteria listed in the TRAN process, as shown above, will be defined as routine maintenance work required for the safe and efficient operation of the Tote Road. To provide clarity on the types of activities that would trigger the TRAN process and require QIA approval, Table 2.5 outlines the types of work that are classified as maintenance activities and construction activities. Construction activities along the Tote Road, as outlined in Table 2.5, are considered a ‘Tote Road adjustment’ under Section 2.8 of the Commercial Lease and require QIA approval prior to implementation.

TABLE 2.4 TOTE ROAD MAINTENANCE VS. CONSTRUCTION ACTIVITIES

Maintenance Activities	Construction Activities
<ul style="list-style-type: none"> • Road grading that raises the road elevation by less than 2 m. • Road grading that lowers the road elevation by less than 1 m in areas not identified in Table 4.1. • Replacing an existing water crossing (culvert, bridges) without changing the water crossing’s approved design. • Work that involves restoring and/or maintaining a road or water crossings to its approved design. • Armouring, re-contouring and regrading bank embankments and roadside swales and ditches. 	<ul style="list-style-type: none"> • Road grading that raises the road elevation by more than 2 m. • Road grading that lowers the road elevation by more than 1 m. • Changing the design of an existing water crossings and/or sections of road. • Work that results in the centreline of the road changing by more than 10 m. • Realignment of the Tote Road that results in the placement of material within 31 m of the High Water Mark of a natural water body.

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Other relevant requirements under the Commercial Lease that apply to changes made to the Project road network include:

- All Project infrastructure, including roads, will be within the limits of the Impact Areas outlined in the Commercial Lease
- A 50 m buffer of undisturbed land shall be maintained between infrastructure and disturbed areas associated with the Project and the established limits of the Impact Areas outlined in the Commercial Lease

Changes to the Project road network that encroach (within 50 m) or fall outside of the limits of the Impact Areas outlined in the Commercial Lease will need to be approved by the QIA through the Options Exercise Notice (OEN) process, outlined and further discussed in Appendix D of this Plan. The regulatory requirements for changes to project roads and water crossings, including the requirements of the Commercial Lease, Water Licence, and *Fisheries Act Authorization* are described in Appendix E.

2.5.2 WATER LICENCE

Part G of the Type A Water Licence outlines the process for implementing modifications to aspects of the Project related to water use (and waste disposal) including watercourse crossings. Baffinland must submit applications for modifications at least 60 days prior to beginning the modifications and must receive written notification from the Board before proceeding. Applications must contain the following information:

- A description of the facilities and/or works to be constructed
- The proposed location of the structure(s)
- Identification of potential impacts to the receiving environment
- A description of monitoring required, including sampling locations, parameters measured and frequencies of sampling
- Schedule for construction
- Drawings of engineered structures stamped by a licensed Professional Engineer in Nunavut
- Proposed sediment and erosion control measures

As-built plans and drawings stamped by an Engineer must also be submitted to the Board within 90 days of completion of the modification.


2.5.3 FISHERIES ACT AUTHORIZATIONS

The Tote Road crossings that are subject to the Authorization under the *Fisheries Act* NU-06-0084 (DFO, 2007) or Letters of Advice issued by DFO are listed in the Environmental Protection Plan (EPP).

The fish and fish habitat protection provisions of the *Fisheries Act* are described in the *Fish and Fish Habitat Protection Policy Statement* (DFO, 2019a). Plans for additional new or modified crossings other than what is described above can be submitted to DFO through its Request for Review process (DFO, 2019b).

2.5.4 SUMMARY

To ensure compliance with the regulatory requirements, Baffinland's Sustainable Development department shall be consulted for any changes to the Project road network and/or water crossings. No changes to the Project road

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network, including water crossings, shall be initiated without prior approval from Baffinland's Sustainable Development department.

Table 2.6 outlines the typical work activities associated with managing the Project road network and the associated regulatory approvals required for each type of activity.


A concordance table that outlines the terms and conditions included in the Project Certificate No. 005, Type 'A' Water Licence and the Commercial Lease that pertain to the management of the Project road network is provided in Appendix B.

TABLE 2.5 REGULATORY APPROVALS FOR CHANGES TO THE PROJECT ROAD NETWORK

Type of Work	Description of Work	Regulatory Approvals Required
Regrading of a road	<ol style="list-style-type: none"> 1. Change in road grade that involves increasing road elevation by less than 2 m. 2. Change in road grade that involves increasing road elevation by more than 2 m. 3. Change in road grade that involves decreasing the elevation by less than 1 m in areas not identified in Table 3.1. 4. Change in road grade that involves decreasing the elevation in permafrost sensitive areas identified in Table 3.1. 	<ol style="list-style-type: none"> 1. None 2. TRAN (if change occurs on the Tote Road) 3. None 4. TRAN (if potential for permafrost degradation exists from proposed re-grading work and any associated cuts)
Change to an existing water crossing	<ol style="list-style-type: none"> 1. A change that does not alter the approved design of a water crossing (i.e. size & number of culverts, bridge design). 2. A change that alters the approved design of a water crossing. 	<ol style="list-style-type: none"> 1. DFO approvals (if change occurs at a fish bearing water crossing) 2. TRAN (if change occurs on the Tote Road) 3. DFO approvals (if the change occurs at a fish bearing water crossing)
Installation of a new water crossing	<ol style="list-style-type: none"> 1. Installation of a new non-fish bearing water crossing. 2. Installation of a new fish bearing water crossing. 	<ol style="list-style-type: none"> 1. TRAN (if the water crossing is along the Tote Road) 2. TRAN (if the water crossings is along the Tote Road) 3. DFO approvals
Road realignment	<ol style="list-style-type: none"> 1. A road re-alignment where the center line of the road is moved less than 10 m. 2. A road re-alignment where the center line of the road is moved more than 10 m. 	<ol style="list-style-type: none"> 1. OEN (if realignment encroaches on Impact Area limits) 2. TRAN (if realignment occurs on the Tote Road and involves placing material within 31 m of the High Water Mark of a nearby water body) 3. TRAN (if realignment occurs along the Tote Road) 4. OEN (if realignment encroaches on Impact Area limits)
Construction of a new service or access road	<ol style="list-style-type: none"> 1. Construction of a new service road at a Project site with no associated water crossings. 	<ol style="list-style-type: none"> 1. OEN (if new road encroaches or fall outside the Impact Area limits) 2. Water Licence Modification under the Type 'A' Water Licence

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Type of Work	Description of Work	Regulatory Approvals Required
	2. Construction of a new service road at a Project site that includes multiple water crossings.	3. DFO approvals (if water crossings are fish bearing) 4. OEN (if new road encroaches or falls outside of Impact Area limits)

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3 IMPLEMENTATION

This section of the Plan describes the general mitigation measures implemented to minimize health and safety risks and environmental effects associated with the construction, operation and maintenance of Project roads.

3.1 THRESHOLDS

Thresholds are an important element of adaptive management (Section 2.3) and the establishment of TARPs (Section 5). The construction, operation and closure of Project roads has the potential to affect various elements of the environment, including air quality, land use, water quality and wildlife. As noted in Section 1.2, the Roads Management Plan is an area/activity management plan that overlaps with other discipline-specific management plans for those components of the environment. Hence, thresholds that apply to road operations in most instances have been established under those other discipline-specific management plans (Table 3.1). Specific wording of these thresholds is presented in the TARP (Table 5.1).

TABLE 3.1 THRESHOLDS TRIGGERING SHORT-TERM RESPONSES

Performance Indicator	Threshold	Source
Dust	Qualitative descriptions of significant dust established in the Dust Mitigation Protocol.	Air Quality and Noise Abatement Management Plan (AQNAMP)
Land use / public safety	Qualitative thresholds related to adherence to the Project's safety protocols and perceived risk of injury or fatality.	Established in this plan ¹
Water use	Applicable thresholds established in another plan.	FWSSWMP
Runoff water quality	Applicable thresholds established in another plan.	Established in this plan
Snowbank height	Applicable thresholds established in another plan.	TEMMP
Wildlife health/mortality	Applicable thresholds established in another plan.	TEMMP

NOTE:

1. To be validated or modified according to future Culture, Resources and Land Use monitoring, Safety Protocol and Communication Plan, and Controlled Access Policy.


3.1.1 INUIT-IDENTIFIED THRESHOLDS

3.1.2 INUIT THRESHOLDS RELATED TO DUST AND CARIBOU WILL BE DEVELOPED AND PROPOSED BY THE QIA THROUGH THE INUIT STEWARDSHIP PLAN. ONCE MADE AVAILABLE AND AGREED TO, THEY WILL BE INCLUDED IN THIS PLAN AS NEEDED. EFFECT PREDICTIONS

Adaptive management includes short-term and longer-term review and response cycles (Section 2.3). The thresholds described above (discharge limits, receiving water quality guidelines, and future Inuit observational guidelines) are applied to guide short-term adaptive management through implementation of the TARPs (Section 5).

The effects predictions from the FEIS and addendums are thresholds that are appropriate for longer-term review and response cycles, such as the annual review of regulatory compliance and unexpected effects. The effects predictions from the FEIS and addendums can be used comparison to the Project's performance as described in

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Section 6.1 Annual Review of Compliance and Unanticipated Effects. The Company may also identify the need for further adaptive management when unanticipated effects or effects that exceed FEIS predictions occur.

3.2 CONSTRUCTION OF PROJECT ROADS AND WATER CROSSINGS

Construction of roads at the Project will be conducted using 1) the fill technique; or 2) the cut-and-fill technique. Road construction using the fill technique will involve placing material on top of existing ground surfaces and spreading/contouring the material to design specifications. Materials for the fill technique will be sourced from approved sources, including approved borrow sources and quarries outlined in the Borrow Pit and Quarry Management Plan.

In contrast, the cut-and-fill technique will be used in areas where material will need to be relocated along a section of road to achieve the design road grade. Material and aggregate used during the cut-and-fill technique will be sourced from approved borrow sources and quarries outlined in the Borrow Pit and Quarry Management Plan. In certain scenarios, surface and blasted material from cuts will be utilized to supplement aggregate and material quantities required to construct the road realignment. Quantities of material and aggregate used from these cuts will be determined using the methods outlined in the Milne Inlet Tote Road Quarry and Borrow Source Management Plan (BAF-PH1-830-P16-0048).


Because the cut-and-fill technique involves excavating sections of existing road bed and/or ground surface and can result in changes to the thermal regime (active layer and permafrost), as a new active layer is created, the cut-and-fill technique will be used in areas where the fill-technique is not practical and/or feasible as a result of the area's local topography. To prevent the ponding of water and mitigate risks associated with slope erosion and overall stability, the side slopes of cut and fill areas will be graded to a slope between 1H:1V to 2H:1V.

3.2.1 MEASURES TO PROTECT THE AQUATIC ENVIRONMENT

As operations at the Project continues to evolve, changes to Project roads and/or water crossings will be required. To minimize potential impacts to surface water quality and fish, construction of roads and the installation/modification of water crossings will occur during the winter months, when practical. Construction during the winter months will ensure that fish are absent from fish bearing water crossings near construction areas and will minimize sedimentation and water quality concerns associated with surface water drainage at or near construction areas. If surface water flows are present during construction, surface water drainage and sedimentation concerns will be managed using the sedimentation control measures outlined in Section 3.3.5 of this Plan and further outlined in the SWAEMP.

Environmental guidelines and mitigation measures implemented during the repair, modification and/or installation of water crossings (i.e., culverts), during frozen conditions and periods of flow, are detailed in the SWAEMP. Culvert and bridge installations shall be designed and constructed as to not encroach on the natural channel width by the placement of abutments, footings or armouring below the ordinary High Water Mark (Type 'A' Water Licence, Part D, Item 22). Material from below the ordinary High Water Mark of a water body will not be removed unless the removal has been authorized by the NWB (Type 'A' Water Licence, Part E, Item 12).

Monitoring of downstream water quality during and following crossing installations is described in the SWAEMP.

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Post construction activities and performance monitoring for changes to Project roads and water crossings are discussed in Section 5.1 of this Plan.

3.2.2 MEASURES TO PROTECT TERRESTRIAL WILDLIFE

Snow management activities will, throughout the winter season, maintain a snowbank height less than 1 m with smooth tops along the Tote Road. This will permit caribou to cross the transportation corridor without being blocked by steep snowbanks. In addition to reducing the barrier effect, this snow management practice will also likely reduce drifting snow.

3.2.3 MEASURES TO PROTECT UNIQUE LANDFORMS AND ARCHAEOLOGICAL SITES

Prior to finalizing a proposed change to the Project's road network, unique landforms and archaeological resources will be surveyed and taken into account. Whenever possible, the alignment of new roads will avoid unique landforms and archaeological sites. At all times, activity in or around archaeological sites will be conducted as per the Cultural Heritage Resource Protection Plan.

3.3 OPERATIONAL PROCEDURES

3.3.1 ROUTINE ROAD MAINTENANCE

Roads will be routinely graded to prevent rutting (furrow creation). Approved quarries and borrow sources will be maintained to secure access to sand and gravel as required for road maintenance.

3.3.2 MAINTENANCE OF WATER CROSSINGS

Water crossings (i.e., culverts, bridges) will be regularly monitored to ensure unobstructed passage of water through the natural drainages and existing streams and rivers. Maintenance will be performed as required. Maintenance, upgrades, and adaptive management may be required due to degradation of the structure(s), changes in flow regime (either naturally occurring or as a result of new project infrastructure), or mitigation measures required in response to sedimentation or erosion events. Maintenance work conducted on water crossings will take into account the environmental guidelines outlined in the SWAEMP for water crossing repairs, modifications and installations.

3.3.3 SNOW MANAGEMENT


During the winter months, drifting snow is likely to accumulate in certain areas of the Project road network. Roads will be designed to minimize drifting snow on road embankments.

The Snow Management Plan describes the practices for clearing and stockpiling snow, and identifies specific areas designated to stockpile snow to minimize the release of sediment and debris into nearby waterbodies during freshet. Where practical, sedimentation control measures (i.e., silt fences) will be installed downstream of snow stockpile areas to capture sediments contained within snow melt during freshet. Freshet preparation and management is further discussed in Section 3.2.4 of this Plan.

Another important mitigation measure is to restrict snowbank heights along Project roads to 1 m or less so that snowmobiles and animal crossings are not unnecessarily impeded. Lower snowbank heights also provide a better line of site for drivers operating on project roads.

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3.3.4 FRESHET MANAGEMENT

Significant surface water flows typically occur during freshet, and these higher flows can result in erosion and damage to road embankments and water crossing infrastructure. Improper management and/or lack of preparation for freshet can lead to significant washouts of Project roads resulting in road hazards and safety concerns, environmental incidents (i.e., sediment releases), production losses, schedule delays, and loss of reputation for the Company, as well as regulatory enforcement.

Baffinland has gained a significant amount of experience managing freshet during its operation of the Project and has developed the following plans and procedures to mitigate potential impacts associated with freshet:

- Snow Management Plan
- Freshet Preparations - Culvert Excavation Procedure

Personnel responsible for the management of roads and water crossings during freshet shall be familiar with the plans and procedure outlined above.

In general, the following mitigation measures are implemented each year to manage surface water flows during freshet:

- Removal of snow upstream and downstream of water crossings (i.e., culverts) prior to freshet
- Steaming culverts that are blocked by ice or snow prior to freshet
- Addressing identified obstructions that could prevent surface water flows at water crossing locations (i.e., steaming culverts, breaking up ice dams near bridges, etc.) during freshet
- Installation of sedimentation control measures (i.e., silt fences, check dams, riprap), as required
- Conducting repairs/modifications to surface water management infrastructure, as required


3.3.5 SEDIMENT AND EROSION CONTROL

Land disturbances during maintenance activities, road construction and operation, culvert installation and excavation of cut and fill areas have the potential to cause erosion and release sediment-laden runoff into nearby water bodies. In addition, the removal of surface material in Arctic regions can cause the underlying permafrost to melt and result in the pooling of water, destabilization of landforms and sedimentation and erosion issues.

Prior to implementation, maintenance and construction activities associated with the Project road network will be assessed for potential risks associated with erosion, permafrost degradation and sedimentation. Based on the risk assessment, effective mitigation and control measures will be implemented prior to the commencement of the planned activities. Sediment and erosion control measures may include, but are not limited to, silt fences, erosion control mats (fascines), check dams, erosion blankets/geotextile lining, sand bags, terraces, benching, flocculants and rip-rap structures.

To mitigate possible permafrost degradation from surface material removal, the following measures will be implemented:

- Removal of surface material (e.g., cut-and-fill technique) shall be avoided where possible to reduce permafrost degradation and will only occur at approved locations
- Where feasible, areas will be graded by filling in low areas rather than cutting into high areas

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- Insulating material and/or erosion control material (such as concrete fabric or riprap) will be used to reduce potential permafrost degradation and erosion, as required

Baffinland has developed multiple procedures and protocols to address concerns regarding erosion, permafrost degradation and sedimentation at the Project in both the EPP and the SWAEMP.

3.3.6 DUST MANAGEMENT

Dust is inevitable on all Project roads during the summer months. Road dust has the potential to become a health, safety and environmental concern. Hence, the control of dust must be a fundamental part of any environmental management plan. Dust on Project roads is formed when fine particles become entrained in the atmosphere by the turbulent action of wind or by the mechanical disturbance of fine materials. Excessive dust can lead to:

- Decreased visibility along Project roads leading to increased risk of vehicle accidents
- Potentially adverse health effects for people and wildlife who inhale airborne particles
- Potentially adverse environmental effects including limiting photosynthesis levels on plants due to dust deposition on leaves, and introducing contaminants to water ways
- Premature wear on engines and motor vehicles from increased intake of fine particles into engines on roadways


Dust mitigation measures associated with roads to be implemented will include the following:

- Minimize disturbances and manage all land clearings
- Construct roads with low silt content material and surface heavily used roads (Tote Road, Mine Haul Road) with a granular cover
- Enforce reduced speed limits for all traffic
- Apply a dust suppressant using appropriate equipment to heavily used roads, and escalate dust suppression efforts (increased frequency, use of approved chemical dust suppressants) as dust becomes visibly significant
- Educate Tote Road vehicle operators on the importance of reporting the presence of visible dust to optimize dust suppression efforts.

Dust suppression methods will be employed when “significant” dust generation is observed. The determination if dust generation is significant is at the professional opinion and discretion of the Operations Supervisors on-site with consultation with the Baffinland Environmental Department Representative and QIA Environmental Monitors on-site. As a guideline, dust that is visibly being carried as a cloud off the roadway should be considered significant.

The Site Services department will be responsible for the dust management of service roads at Project sites (e.g. Milne Port, Mine Site). The Road Maintenance department will be responsible for dust management of the Tote Road and the Mine Operations department will be responsible for the dust management of the Mine Haul Road and pit operations.

Approved dust suppressants (i.e., calcium chloride, water and Dust Stop Municipal Blend (DSMB, now called DUST/BLOKR®), etc.) shall be used on the roads, particularly on heavy-use sections, as per the Dust Management Protocol (Appendix F of the Air Quality and Noise Abatement Management Plan). Due to frozen conditions between September and May, dust suppressants shall only be used at the Project from June to August.

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Throughout the life of the Project, Baffinland will continue to trial new dust suppressants to determine the most effective dust suppressants for site conditions. For dust suppressants not approved for use in Nunavut, Baffinland will seek approval for new dust suppressants by following the protocols outlined in Section 2.3 of the *Environmental Guideline for Dust Suppression for Nunavut* (Government of Nunavut, 2002).

3.3.7 TRAFFIC MANAGEMENT

The following subsections discuss how traffic on the Project road network will be managed.

3.3.7.1 SPEED CONTROL AND SIGNAGE

Speed limits for Project roads have been established and communicated to all Project personnel. Baffinland employees and contractors who operate vehicles on-site will be required to undergo vehicle specific training sessions, which will include training on all traffic management procedures and restrictions. Road signs will indicate hazards and blind road curves or intersections, radio frequencies, and radio call-in requirements.

Kilometre markers are positioned approximately each kilometre along the Tote Road. These markers are used to identify the position of active road users, incidents and emergencies. The markers will also be used for reporting wildlife sightings and observations of non-Project personnel.

3.3.7.2 RIGHT OF WAY


Whenever possible, all traffic will yield to wildlife encountered on roads and lighter vehicles will yield to heavier equipment. In the case of approaching ore haul trucks on the Tote Road, the southbound ore haul truck will yield to the northbound ore haul truck.

3.3.7.3 ROAD CLOSURE

Whenever unsafe conditions are identified (washout, severe rutting, vehicle breakdown, whiteout conditions, etc.), sections of the Project road network will be closed until the required maintenance is completed or weather conditions improve. Road closure and traffic management will be directed by the senior Road Maintenance representative, in consultation with the other senior management members on site. Tote Road travel and road management activities will adhere to the Tote Road Travel Procedure (BAF-PH1-810-PRO-0002) and the Whiteout and Windstorm Conditions Procedure (BAF-PH1-810-PRO-0001).

3.3.8 COMMUNICATION

Project vehicles will be equipped with radios. Incidents or unsafe road conditions will be reported by road users to the Dispatch Operator and Security of the nearest Project site. To ensure the safety of road users and to mitigate potential vehicle incidents, road users will be required to radio their positions when departing or arriving at Project sites and when approaching blind curves or hills. These call-in locations will be posted and communicated to vehicle operators during orientation and mandatory training sessions.

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3.3.9 PUBLIC USE OF PROJECT ROAD NETWORK

For safety reasons, use of service roads at Milne Port and the Mine Site will be restricted to Baffinland's employees and Contractors. The Tote Road is considered a public easement under the *Nunavut Agreement* (Indian and Northern Affairs Canada and Nunavut Tunngavik Inc., 2010). The management of public access to the Tote Road and Project sites is described further in Baffinland's Hunter and Site Access Procedure (BAF-PH1-830-PRO-0002).

The monitoring of public use of the road is described in Section 5.3.


3.3.10 WILDLIFE SIGHTINGS

Wildlife sightings along the Project road network shall be reported and recorded as incidental observations on the Wildlife Logs posted at Project sites (Section 5.4). Figure 3.1 is the caribou encounter decision tree, which describes the appropriate responses to be implemented by drivers on the Tote Road if caribou are observed on or near to the road.

The following protection measures will be implemented to protect wildlife (and specifically caribou) during road operations (from Section 4 of the EPP):

- Mobile equipment and vehicles shall yield the right-of-way to wildlife.
- Traffic is to slow down and keep distance from the animals as much as possible. If necessary, traffic (including trains) will stop to enable crossings of groups or to allow groups of caribou paralleling the road to move into adjacent habitat. Caribou occurrence in the vicinity of the road and railway and their responses to traffic will be monitored by on the ground behavioural observations, to determine if it is apparent that caribou are being disturbed or displaced by construction or traffic. Specific guidance is provided in the Caribou Encounter Decision Tree.
- All caribou sightings will be reported to the Environment Department, who will keep geo-referenced records of caribou sightings. This will enable Project biologists to monitor caribou activity in relation to the Project.
- If caribou approach a Project activity site before work commences, the Environment Department will be notified immediately and will determine the necessary measures that need to be taken to protect caribou activity.
- If caribou approach a Project Site while work is in progress, caribou will be observed for signs of disturbance.
- If the caribou are disturbed, the activity will be modified or cease until the caribou have moved away or they are guided away from the worksite.
- A wildlife monitor will be periodically present on site during the calving season to detect calving activities near the Northern Transportation Corridor, monitor cow/calf behaviour in relation to traffic, designate a temporary no-stopping zone, guide traffic, and document measures taken to reduce sensory disturbance to calving caribou.
- Monitoring and mitigation measures will be implemented at points where roads pass through caribou calving areas, particularly during caribou calving times.

Refer to Operational Environmental Standard 4.12 -Caribou Protection Measures and included in Baffinland's EPP, for more information on reporting wildlife observations.

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3.4 EMERGENCIES INCLUDING SPILLS

The Emergency Response Plan contemplates response actions for a number of emergencies that could occur in relation to road operations:

- Serious injury
- Fatality
- Missing persons (employee or member of the public)
- Extreme weather conditions
- Fires and explosions
- Vehicle instances
- Fuel and other chemical spills

Incidents will be reported to the Health and Safety Superintendent and/or the Environmental Superintendent, depending on the nature of the incident, who will in turn communicate the incident to senior management. All incidents are reported, using the Baffinland Incident Investigation Form, and investigated to determine the cause(s) of the incident as well as the corrective actions necessary to prevent the reoccurrence of the incident.

To effectively manage emergency responses, Baffinland has adopted a tiered emergency classification scheme (Figure 3.2). Each level of emergency, based on its severity, require varying degrees of response, effort, and support. Each level has distinct effects on normal business operations, as well as requirements for investigation and reporting. Levels of classification specific to spill response are as follows:

- Level 1 (Low) - Minor accidental release of a deleterious substance with:
 - No threat to public safety
 - Negligible environmental impact to receiving environment
- Level 2 (Medium) - Major accidental release of a deleterious substance with:
 - Some threat to public safety
 - Potential Moderate environmental impact to receiving environment
- Level 3 (High) - Uncontrolled hazard which:
 - Jeopardizes project personnel safety
 - Potential significant environmental impacts to receiving environment

Baffinland will follow the procedures in its Spill Contingency Plan and Emergency Response Plans. For Spill Response Level 1 the Spill Contingency Plan will be triggered, while for Spill Response Levels 2 and 3 the Spill Contingency Plan and Emergency Response Plan will be triggered. Sewage spills are treated the same as more immediately hazardous hydrocarbon-based spills.

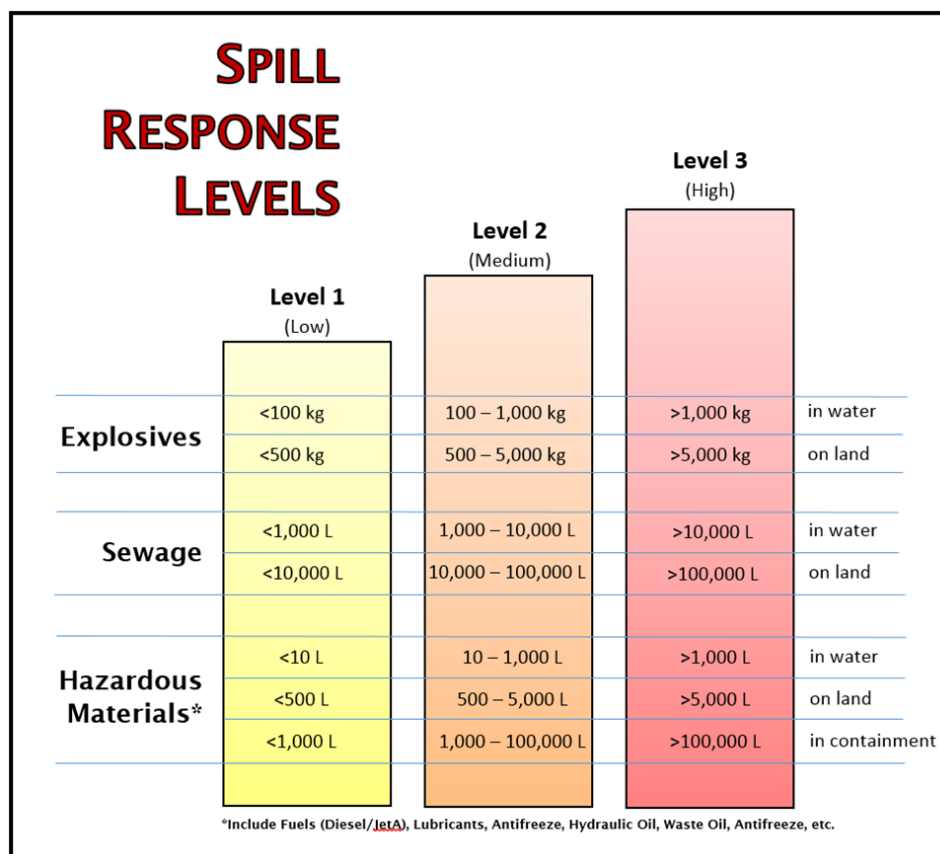


FIGURE 3.1 EMERGENCY SPILL RESPONSE LEVELS

3.5 CLOSURE AND RECLAMATION OF THE PROJECT ROAD NETWORK

The Project road network will be rehabilitated as outlined in Baffinland’s Interim Closure and Reclamation Plan. In general, road material stockpiles will be re-graded and water crossings removed to re-establish natural contours and drainage paths throughout the Project area.


3.6 MANAGEMENT OF HISTORICAL TOTE ROAD BORROW SOURCES

Aggregate and material along the side of the Tote Road was used in the past to support Tote Road maintenance activities and upgrades. As a result of these past activities, permafrost degradation has developed at several historical borrow source locations along the Tote Road between kilometre 50-64 and 70-100.

As material and resources become available, Baffinland will endeavour to address the areas of permafrost degradation along the Tote Road. Historical borrow sources will be prioritized and addressed based on safety and environmental concerns posed by the permafrost degradation. Permafrost degradation will be addressed by draining the borrow source of water; filling the borrow source with available material and aggregate to insulate the permafrost and prevent further degradation, and re-contouring the area to prevent pooling of precipitation and


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snow melt. Baffinland will continue to monitor for, and address safety and environmental concerns associated with the historical borrow sources along the Tote Road.

Surface water runoff/discharges from historical borrow sources will be monitored as outlined in the Milne Inlet Tote Road Quarry and Borrow Source Management Plan.

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4 ROLES AND RESPONSIBILITIES


The personnel responsible for implementing this plan and their respective roles are described in Table 4.1.

TABLE 4.1 ROLES AND RESPONSIBILITIES FOR ROADS MANAGEMENT

Position	Responsibilities
General Manager	<ul style="list-style-type: none"> • Reports to the Chief Executive Officer • Responsible for providing oversight for all Project operations and allocating the necessary resources for the operation, maintenance, and management of the Project road network
Mine Operations Manager / Superintendent	<ul style="list-style-type: none"> • Reports to the COO / General Manager • Provides oversight for all Mine operations, including the operation, construction and maintenance of the Mine Haul Road that runs from the open pit to the crushing operations at the Mine Site
Site Services Manager / Superintendent	<ul style="list-style-type: none"> • Reports to the COO / General Manager • Provides oversight for all Site Services operations, including the operation, construction and maintenance of the Project service roads located at Milne Port and the Mine Site, with the exception of the Mine Haul Road
Road Maintenance Manager / Superintendent	<ul style="list-style-type: none"> • Reports to the COO / General Manager • Provides oversight for all Road Maintenance operations, including the operation, construction and maintenance of the Tote Road that runs between Milne Port and the Mine Site • The Road Maintenance department has the lead responsibility of managing traffic on the Tote Road, which includes: <ul style="list-style-type: none"> ○ Monitoring weather forecasts and conditions ○ Planning, scheduling and managing road construction and maintenance ○ Traffic management - identifying operational, safety and environmental concerns on the Tote Road and taking the appropriate action including road closures, in consultation with other senior management members on site
QIA Regulatory Manager (IIBA)	<ul style="list-style-type: none"> • Directs QIA's onsite environmental resources • Liaise with Baffinland's Permitting and Compliance Manager and/or Environmental Superintendents • Reviews regulatory submissions on behalf of the QIA • Member of the QIA-Baffinland Adaptive Management Working Group
QIA Environmental Monitor (IIBA)	<ul style="list-style-type: none"> • Monitors implementation of commitments, environmental compliance, and QIA interests • Participate in routine compliance inspections and monitoring alongside Baffinland staff • Participate follow-up corrective action undertaken regarding non-compliance events including spills • Weekly reporting to the QIA Regulatory Manager • Presents annual monitoring data to communities • The core responsibilities of this position are described completely in the IIBA

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Position	Responsibilities
Health, Safety & Environment (Sustainable Development) Departments	<ul style="list-style-type: none"> Support the management of the Project road network regarding health, safety and environmental concerns and obtaining the appropriate regulatory approvals Report incidents to senior management and the appropriate regulatory agencies and stakeholders Conduct inspections and monitoring to ensure compliance with applicable regulations and commitments
All Departmental Supervisors	<p>Supervisors for all departments are responsible for the following:</p> <ul style="list-style-type: none"> Ensure that any worker operating a vehicle on the Project road network is trained and qualified regarding road safety and driving communication protocols Ensure that light vehicles or equipment travelling the Tote Road in winter months, or in periods of severe weather conditions, are equipped with an emergency survival kit Ensure that any workers traveling on the Project road network have all the required safety equipment and are following all PPE requirements and procedural controls Ensure work crews comply with reporting when their vehicles enter and depart Project sites when using the Tote Road Ensure weather conditions are suitable for the travel and/or work activity required
Dispatch Operator	<ul style="list-style-type: none"> Distribute, along with Security, Tote Road conditions and status updates, including applicable blasting notifications for maintenance and construction activities Monitor ore haul traffic on the Tote Road Security at Project Sites Distribute, along with Ore Haul Dispatch, Tote Road conditions and status updates, including applicable blasting notifications for maintenance and construction activities. Maintain active traffic log of vehicles on the Tote Road
Vehicle and Equipment Operators	<ul style="list-style-type: none"> All personnel operating vehicles or equipment at the Project are responsible to comply with the requirements of this Plan
Geotechnical Engineer	<ul style="list-style-type: none"> Inspect significant changes to the Project road network, including changes that trigger the TRAN process, during biannual summer geotechnical inspections required by Part D, Item 18 and Part I, Items 12 & 13 of the Type 'A' Water Licence

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5 MONITORING AND REPORTING REQUIREMENTS

Monitoring associated with this plan includes the following:

- Post-construction performance monitoring
- Routine inspections
- Monitoring of public use of Project roads
- Monitoring wildlife sightings
- Mapping and Identification Process (Commercial Lease requirement to record the use of Specified Substances and to account for project changes in an annual update to reclamation security)

These monitoring programs are described in Sections 5.1 to 5.5.

- In addition, road operations have the potential to result in environmental effects related to various valued ecosystem components (VECs) and valued socioeconomic components (VSECs). Other management plans outline such monitoring, including Air Quality and Noise Abatement Management Plan (BAF-PH1-830-P16-0002).
- Socio-Economic Monitoring Plan (BAF-PH1-830-O16-0051)
- Water use
- Terrestrial Environment Mitigation and Monitoring Plan (BAF-PH1-830-0027)

The results of these monitoring programs inform ongoing road operations. Table 5.1 identifies low, moderate and high action responses for the above environmental effects monitoring, excluding water use (addressed in the FWSSWMP) and sedimentation-related aquatic effects (addressed in the SWAEMP).

5.1 POST-CONSTRUCTION MONITORING

5.1.1 ROADS

Post construction performance monitoring for changes to the Project roads will be conducted by the Road Maintenance department, in consultation with the Baffinland's Health & Safety and Environment departments. Significant changes to the Project road network, including changes that trigger the TRAN process (refer to Appendix C), will be included in the next scheduled geotechnical inspection prescribed by the Type 'A' Water Licence (Part D, Item 18; Part I, Items 12 & 13) and conducted by a Professional Geotechnical Engineer registered in Nunavut.

TABLE 5.1 TRIGGER ACTION RESPONSE PLANS FOR ROADS OPERATION AND MAINTENANCE

Project Activity	Objective	Performance Indicator	Monitoring Program / Plan	Condition Status / Thresholds			Pre-defined Response(s)		
				Low Risk	Moderate Risk	High Risk	Low Risk	Moderate Risk	High Risk
Road construction, operation, and maintenance	Mitigate potential impacts to water and protect aquatic ecosystems	TSS and turbidity	Northern Corridor Monitoring Program / Environmental Guidelines for Water Crossing Repairs, Modifications and/or Installations	Elevated TSS (>30 mg/L) that is not project related (downstream TSS does not exceed upstream TSS by more than 50 mg/L or 10% when >250 mg/L).	Elevated TSS (>30 mg/L ⁴) that is not project related (downstream TSS does not exceed upstream TSS by more than 50 mg/L or 10% when >250 mg/L).	Sustained non-compliance, even after applying standard mitigation under moderate risk response.	<u>Env't Dept</u> : Investigate cause and determine need for additional mitigation. Continue monitoring at regular frequency (weekly during freshet; monthly during summer). <u>Operations Dept</u> : Implement any additionally recommended mitigation.	<u>Env't Dept</u> : Increase monitoring to re-sample non-compliant crossing 48 hours after and within 7 days of documented TSS exceedance. Report exceedance of discharge to operations department after receiving results. <u>Operations Dept</u> : Assess cause and take immediate action to implement enhanced mitigation measures.	<u>Env't Dept</u> : Continue increased monitoring – maintain enhanced monitoring schedule until a compliant sample analytical result is received. Communicate issue to the QIA; conduct an investigation of cause as to why the non-compliance has not been adequately addressed. Implement mitigations to reverse trend.
		Daily Water Use	Water use / Fresh Water Supply, Sewage and Wastewater Management Plan (FWSSWMP)	Thresholds (daily limits) and adaptive management approach is described in the FWSSWMP					
	Minimize fugitive dust emissions	Daily Dustfall (g/m ² /30-day)	Dustfall Monitoring Program/air Quality and Noise Abatement Management Plan	Thresholds and responses associated with dustfall monitoring is described in the AQNAMP					
		Airborne Dust	Visual Monitoring	Dust is generated from road traffic but is not significant (Dust is not visibly being carried as a cloud off the roadway).	Significant dust is generated (Dust is visibly being carried as a cloud off the roadway).	Significant dust is generated (Dust is visibly being carried as a cloud off the roadway), and it is impairing driver visibility.	<u>Responsible Dept</u> ¹ : Enforce speed limits.	<u>Responsible Dept</u> ¹ : Implement dust suppression with water and consider additional mitigation (supplement dust suppression efforts using approved dust suppressants (CaCl, DustBlok [®] or equivalent)).	In addition to moderate risk actions: <u>Responsible Dept</u> ¹ : Immediately implement safety measures in accordance with judged level of risk
	Minimize impacts on land use and harvesting	Inuit Land Use and Harvesting Success	Human Use Log / Culture, Resources and Land Use (CRLU) Monitoring Program	<i>Interim process subject to development of the CRLU Monitoring Program, Safety and Communication Protocol, etc.</i>					
	Protect the health and safety of workers and other land users	Reported H&S Incidents involving workers and other land users	Health and Safety (H&S) Incident Reporting	Drivers and/or land users appear to comply with safe practices and demonstrate an awareness of road rules and potential safety risks; however, communication between the groups is not established.	Drivers and/or land users are not complying with road rules resulting in a near miss incident.	H&S incident resulting in injury, property damage or lost time.	<u>Drivers</u> : Report location of land users near the road to all drivers. <u>Security</u> : When possible inform land users of Safety and Communication Protocol while travelling on or near the road.	<u>Drivers</u> : Report non-compliant behaviours and potentially unsafe situations to other drivers/ dispatch and complete incident reporting. Nearby drivers increase defensive driving and report any observations. <u>Dispatch</u> : Direct drivers to undertake additional defensive measures.	In addition to moderate risk actions: <u>Dispatch</u> : Notifies other drivers in area to stop immediately. <u>Security</u> : Investigates risk and identifies and directs follow-up measures. <u>Roads Superintendent and H&S</u> : Completes incident investigation.

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Project Activity	Objective	Performance Indicator	Monitoring Program / Plan	Condition Status / Thresholds			Pre-defined Response(s)		
				Low Risk	Moderate Risk	High Risk	Low Risk	Moderate Risk	High Risk
Road construction, operation, and maintenance	Minimize the effect of roads snow management on caribou movement	Snowbank height	Snowbank height monitoring / Terrestrial Environment Mitigation and Monitoring Plan (TEMMP)	Snowbanks approaching 1 m in height.	Snowbanks >1 m high, but not at an established snowmobile crossing area.	Snowbank >1 m high at established snowmobile crossing(s).	<u>Env't Dept:</u> Monitor snowbank heights; notify Road Maintenance of any areas with snowbanks approaching the threshold. <u>Road Maintenance:</u> Schedule snowbank maintenance (cutting down bank heights) before threshold is exceeded.	<u>Env't Dept:</u> Monitor snowbank heights; notify Road Maintenance of any exceedances. <u>Road Maintenance:</u> Schedule snowbank maintenance, prioritizing snowbanks that exceed threshold.	<u>Env't Dept:</u> Monitor snowbank heights; notify Road Maintenance of any exceedances at established snowmobile crossings. <u>Road Maintenance:</u> Snowbank maintenance at snowmobile crossings
	Minimize disturbance effects of road traffic on caribou	Successful implementation of the caribou encounter decision tree	Caribou Encounter Decision Tree (TEMMP)	Proceed as usual when caribou are observed > 100 m from the road and are resting or feeding, or are moving away from the road.	Proceed with caution when: <ul style="list-style-type: none">Caribou are > 100 m from the road and are moving towards the roadCaribou are < 100 m from the road and are resting or feeding, or moving away from the road	Stop when: <ul style="list-style-type: none">Major migrationCaribou are on the roadCaribou are < 100 m from the road and are moving towards the road	<u>Drivers:</u> Alert other drivers of caribou presence.	<u>Drivers:</u> Alert others drivers of the caribou presence and watch for a change in behaviour.	<u>Drivers:</u> When there is a major migration occurring – advise all traffic to halt until further notice and call the Environmental Superintendent. When there are caribou on the road – stop as far back as possible (> 50 m), Alert other drivers and wait until the caribou have crossed before proceeding. When Caribou are < 100 m from the road and are moving towards the road – Stop as far back as possible, alert other drivers and wait until the caribou have crossed before proceeding.
	Prevent injury or mortality of caribou due to collisions with project road traffic	Caribou injury/mortality							
Refer to Caribou Encounter Decision Tree.									

NOTE:

1. Responsible Department refers to the following departments - Road Maintenance Department for the Tote Road, Site Services Department for site roads at the Mine Site and Milne Port, and Mine Operations Department for the Mine Haul Road.

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The primary focus of the post construction monitoring for changes to Project roads, conducted by both the Road Maintenance department and the Professional Geotechnical Engineer, will be to confirm conformity of the road change to the applicable design criteria laid out in the Project's current Civil Design Criteria (Hatch, 2013) and any supporting engineering drawings (e.g. IFCs). Recommendations made by the Professional Geotechnical Engineer will be documented in the biannual geotechnical reports submitted to the NWB, 60 days following each geotechnical inspection (Part D, Item 18; Part I, Item 13). Recommendations made by the Professional Geotechnical Engineer will be used by Baffinland to determine and prioritize any necessary corrective actions and future upgrades to the Project road network.

Changes made to the Project road network each year will be documented in the Annual Report prescribed by the Type 'A' Water Licence and Commercial Lease. As-built documentation will be provided to the appropriate regulators and stakeholders for Project road network changes that required the submission of IFC drawings to obtain the necessary approvals (e.g. TRAN, Water Licence Modification, etc.).

5.1.2 WATER CROSSINGS

Post construction performance monitoring for changes to Project water crossings will be required where work on a water crossing involved the installation, replacement and/or extension of a length of culvert or a design modification to a bridge. Any additional post construction monitoring committed to by Baffinland during the approvals process for a water crossing change (e.g. DFO) will also be performed.

The primary objective of post construction monitoring for changes to Project water crossings will be to confirm conformity of the water crossing change to the applicable design criteria laid out in Project's current Civil Design Philosophy document (Hatch, 2018) and any supporting engineering drawings (e.g. IFCs). The secondary objective of post construction monitoring for changes to Project water crossings will be to confirm that the water crossing change has not resulted in significant impacts to the water quality of surface water flows and fish habitat/passage.

Design conformity for water crossing changes will be confirmed by a qualified and licensed Professional Geotechnical Engineer during the next scheduled geotechnical inspection, required by the Type 'A' Water Licence (Part D, Item 18; Part I, Items 12 & 13). Recommendations made by the Professional Geotechnical Engineer will be documented in the biannual geotechnical reports submitted to the NWB, 60 days following each geotechnical inspection (Part D, Item 18; Part I, Item 13).


Observations and recommendations made by the Professional Geotechnical Engineer and the Professional Fisheries Biologist in concert with the post-construction water quality monitoring results will be used by Baffinland to determine and prioritize any corrective actions and future upgrades to the Project road network.

Changes made to Project water crossings each year will be documented in the Annual Report prescribed by the Type 'A' Water Licence and Commercial Lease. As-built documentation will be provided to the appropriate regulators and stakeholders for Project road network changes that required the submission of IFC drawings to obtain the necessary approvals (e.g. TRAN, Water Licence Modification, etc.).

In addition to monitoring the water quality at locations where changes have been made to the Project road network, Baffinland conducts routine water quality monitoring at select water crossings along the Tote Road each year during freshet and summer months, referred to as the Tote Road Monitoring Program. The Tote Road Monitoring Program focuses on monitoring TSS concentrations upstream and downstream of select Tote Road water crossings and is fully outlined in Appendix F of this Plan.

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5.2 ROUTINE INSPECTIONS

Roads and water crossings are inspected regularly for signs of degradation and maintenance requirements. Periodic visual inspections will be conducted on the Project road network by trained personnel and will occur at regular intervals and after vehicle collisions, heavy precipitation events and construction activities. The Project road network shall be continually inspected over the life of the Project. Road safety, stability and erosion are several of the main factors that will be investigated during the routine inspections.

External inspections are also conducted by the landowners (QIA and CIRNAC). Baffinland prioritizes responding to instances of non-compliance.

5.3 PUBLIC USE OF PROJECT ROAD NETWORK

For safety reasons, use of service roads at Milne Port and the Mine Site will be restricted to Baffinland's employees and Contractors. The Tote Road is considered a public road. The management of public access to the Tote Road and Project sites is described further in the Hunter and Site Access Procedure (BAF-PH1-830-PRO-0002).

Sightings of non-Project personnel shall be reported to the Dispatch Operator and Security of the nearest Project site and recorded on the Human Use logs posted at Project sites. Refer to the Operational Environmental Standard 2.2 - Avoiding Disturbance to Local Land Users, included in Baffinland's EPP, for more information on reporting sightings of local land users and non-Project personnel. This information will be reported annually as part of the CRLU Monitoring Program and will be used to formulate policies and initiatives for Project road use, wildlife harvesting observations, and other related matters.


5.4 WILDLIFE SIGHTINGS

Wildlife sightings along the Project road network shall be reported and recorded as incidental observations on Wildlife Logs posted at Project sites.

This information will be used to inform terrestrial wildlife studies and to formulate mitigation measures for wildlife protection and will be included in the annual terrestrial environment monitoring report (or more frequent) reports to government agencies and stakeholders. Project related wildlife mortalities are to be reported to the required government agencies and stakeholders.

5.5 USE OF SPECIFIED SUBSTANCES FOR PROJECT INFRASTRUCTURE

To monitor the use of Specified Substances (material/aggregate) and changes to Project infrastructure, satellite imagery and volumetric mapping (e.g. PhotoSat) of the Project will be taken on an annual basis using a consistent methodology as described in Schedule A of the Tote Road Reconciliation Agreement, referred to as the Mapping and Identification Process. The Mapping and Identification Process will be used to quantify the volumes of Specified Substances used to support changes to Project infrastructure. Further details on the Mapping and Identification Process, the Tote Road Reconciliation Agreement and compensation for Specified Substances used by the Project are provided in the Milne Inlet Tote Road Quarry and Borrow Source Management Plan.

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5.6 CLOSURE AND RECLAMATION SECURITY

For the purposes of reconciling reclamation and closure security, changes made to the Project road network and infrastructure will be tracked by taking satellite imagery and volumetric mapping (e.g. PhotoSat) on an annual basis as described in Schedule A of the Tote Road Reconciliation Agreement. Changes to reclamation and closure security amounts for the Project road network and infrastructure changes will be reconciled during the Annual Security Review process outlined in the Type 'A' Water Licence and Commercial Lease.

5.7 REPORTING


Reporting of monitoring described in this Plan are identified in Table 5.2.

TABLE 5.2 REPORTING OF MONITORING RESULTS

Monitoring Program	Monitoring Report
Post-construction performance monitoring	Annual Report to the QIA and NWB for Operations
External inspections	
Mapping and Identification Process	
Water use	
Sedimentation-related aquatic effects	
Public use of roads (land use / public safety)	Annual Report to the NIRB
Dustfall monitoring	Terrestrial annual monitoring report, Annual Report to the NIRB
Snowbank height	
Wildlife (caribou)	

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6 REVIEW OF PLAN EFFECTIVENESS

An important element of Baffinland's management system is reviewing the continued suitability, adequacy and effectiveness of each management plan. This will occur through an annual review process as well as scheduled updates.

6.1 ANNUAL REVIEW OF COMPLIANCE AND UNANTICIPATED EFFECTS

Baffinland conducts internal inspections and audits throughout the year, as described in Section 5.2. Throughout the year, immediate corrective actions are taken as appropriate to address instances of non-compliance, as well as unanticipated effects observed. Follow-up corrective actions may also be required. These immediate and follow-up corrective actions are documented in the annual report.

One follow-up corrective action may be to revise mitigation measures or monitoring programs described in the applicable management plans. During the annual reporting cycle, Baffinland staff will review instances of non-compliance as well as unanticipated effects and determine if a review of plan effectiveness is appropriate. This process is articulated on Figure 6.1.

Part of this annual review cycle is the incorporation of IQ, which may include feedback from the Inuit Committee and/or community observations. This process may occur annually whether repeat non-compliance and/or unanticipated effects are identified (Figure 6.1).

6.2 SCHEDULED UPDATES

In addition to the annual review cycle described above, scheduled Plan reviews will occur according to the schedule presented in Table 6.1.

TABLE 6.1 PLAN REVIEW SCHEDULE

Review Event	Description
Prior to construction	Incorporate the appropriate elements of: <ul style="list-style-type: none"> • Safety Protocol and Communication Plan • Controlled Access Policy • CRLU Monitoring Plan
Post-construction	Mandatory management review
Every 3 years during operation	Mandatory management review

NOTE:

1. This is a generic term that applies to Project expansions or other major sustaining capital works.

Baffinland has committed to the development of several documents prior to initiating construction of the Phase 2 Proposal that are relevant to how the Company operates the Tote Road. For this reason, an update to this plan has been scheduled to occur prior to construction so that the relevant contents of these documents can be incorporated into this Plan. Plan updates will be recorded in the Document Revision Record located at the front of the Plan. Each plan update will be provided to the QIA for review and approval before being finalized for implementation.

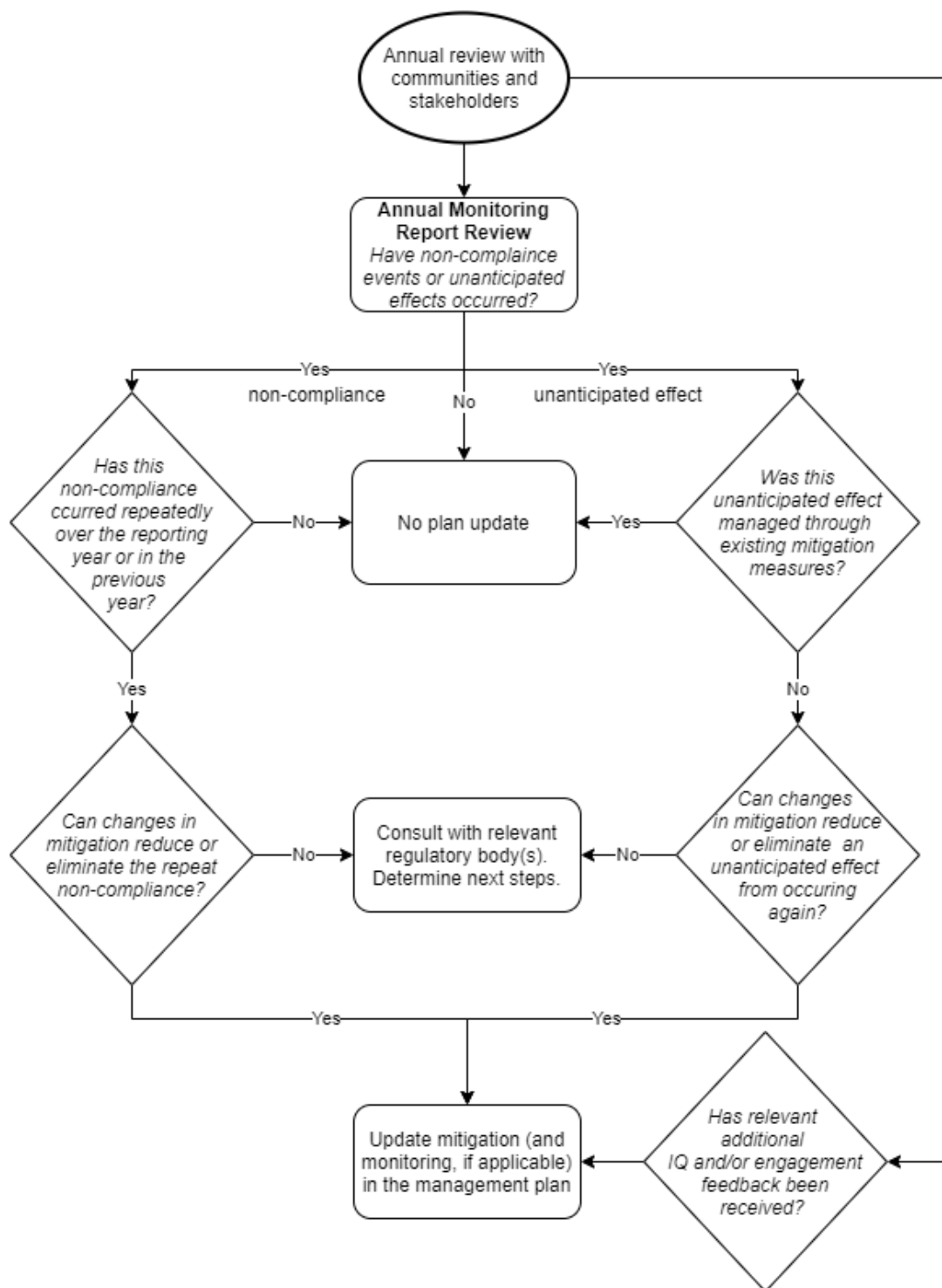



FIGURE 6.1 ANNUAL REVIEW OF PLAN EFFECTIVENESS

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Appendix A

Corporate Policies

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Baffinland Iron Mines Corporation

Health, Safety and Environment Policy

BAF-PH1-800-POL-0001

Rev 3

Approved by: Brian Penney

Title: Chief Executive Officer

Date: May 3rd, 2019

Signature: 

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DOCUMENT REVISION RECORD

Issue Date MM/DD/YY	Revision	Prepared By	Approved By	Issue Purpose
05/07/15	0	EM	TP	For Use
03/07/16	1	JS	BP	Minor edits
04/20/18	2	TS	SA/BP	Minor edits
05/03/19	3	TS	BP	Minor edits

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This Baffinland Iron Mines Corporation Policy on Health, Safety and Environment is a statement of our commitment to achieving a safe, healthy and environmentally responsible workplace. We will not compromise this policy for the achievement of any other organizational goals.

We implement this Policy through the following commitments:

- Continual improvement of safety, occupational health and environmental performance
- Meeting or exceeding the requirements of regulations and company policies
- Integrating sustainable development principles into our decision-making processes
- Maintaining an effective Health, Safety and Environmental Management System
- Sharing and adopting improved technologies and best practices to prevent injuries, occupational illnesses and environmental impacts
- Engaging stakeholders through open and transparent communication.
- Efficiently using resources, and practicing responsible minimization, reuse, recycling and disposal of waste.
- Reclamation of lands to a condition acceptable to stakeholders.

Our commitment to provide the leadership and action necessary to accomplish this policy is exemplified by the following principles:

- As evidenced by our motto “Safety First, Always” and our actions Health and Safety of personnel and protection of the environment are values not priorities.
- All injuries, occupational illnesses and environmental impacts can be prevented.
- Employee involvement and active contribution through courageous leadership is essential for preventing injuries, occupational illnesses and environmental impacts.
- Working in a manner that is healthy, safe and environmentally sound is a condition of employment.
- All operating exposures can be safeguarded.
- Training employees to work in a manner that is healthy, safe and environmentally sound is essential.
- Prevention of personal injuries, occupational illnesses and environmental impacts is good business.
- Respect for the communities in which we operate is the basis for productive relationships.

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We have a responsibility to provide a safe workplace and utilize systems of work to meet this goal. All employees must be clear in understanding the personal responsibilities and accountabilities in relation to the tasks we undertake.

The health and safety of all people working at our operation and responsible management of the environment are core values to Baffinland. In ensuring our overall profitability and business success every Baffinland and business partner employee working at our work sites is required to adhere to this Policy.



Brian Penney
Chief Executive Officer
May 2019

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Sustainable Development Policy



At Baffinland Iron Mines Corporation (Baffinland), we are committed to conducting all aspects of our business in accordance with the principles of sustainable development & corporate responsibility and always with the needs of future generations in mind. Baffinland conducts its business in accordance with the Universal Declaration of Human Rights.

Everything we do is underpinned by our responsibility to protect the environment, to operate safely and fiscally responsibly and with utmost respect for the cultural values and legal rights of Inuit. We expect each and every employee, contractor, and visitor to demonstrate courageous leadership in personally committing to this policy through their actions. The four pillars of our corporate responsibility strategy are:

1. Health and Safety
2. Environment
3. Upholding Human Rights of Stakeholders
4. Transparent Governance

Health and Safety

- We strive to achieve the safest workplace for our employees and contractors; free from occupational injury and illness, where everyone goes home safe everyday of their working life. Why? Because our people are our greatest asset. Nothing is as important as their health and safety. Our motto is "Safety First, Always"
- We report, manage and learn from injuries, illnesses and high potential incidents to foster a workplace culture focused on safety and the prevention of incidents
- We foster and maintain a positive culture of shared responsibility based on participation, behaviour, awareness and promoting active courageous leadership. We allow our employees and contractors the right to stop any work if and when they see something that is not safe

Environment

- Baffinland employs a balance of the best scientific and traditional Inuit knowledge to safeguard the environment
- We apply the principles of pollution prevention, waste reduction and continuous improvement to minimize ecosystem impacts, and facilitate biodiversity conservation
- We continuously seek to use energy, raw materials and natural resources more efficiently and effectively. We strive to develop more sustainable practices. We strive to develop more sustainable practices
- Baffinland ensures that an effective closure strategy is in place at all stages of project development to ensure reclamation objectives are met

Upholding Human Rights of Stakeholders

- We respect human rights, the dignity of others and the diversity in our workforce. Baffinland honours and respects the unique cultural values and traditions of Inuit
- Baffinland does not tolerate discrimination against individuals on the basis of race, colour, gender, religion, political opinion, nationality or social origin, or harassment of individuals freely employed
- Baffinland contributes to the social, cultural and economic development of sustainable communities in the North Baffin Region

Sustainable Development Policy



- We honour our commitments by being sensitive to local needs and priorities through engagement with local communities, governments, employees and the public. We work in active partnership to create a shared understanding of relevant social, economic and environmental issues, and take their views into consideration when making decisions
- We expect our employees and contractors, as well as community members, to bring human rights concerns to our attention through our external grievance mechanism and internal human resources channels. Baffinland is committed to engaging with our communities of interest on our human rights impacts and to reporting on our performance

Transparent Governance

- Baffinland will take steps to understand, evaluate and manage risks on a continuing basis, including those that may impact the environment, employees, contractors, local communities, customers and shareholders.
- Baffinland endeavours to ensure that adequate resources are available and that systems are in place to implement risk-based management systems, including defined standards and objectives for continuous improvement.
- We measure and review performance with respect to our safety, health, environmental, socio-economic commitments and set annual targets and objectives.
- Baffinland conducts all activities in compliance with the highest applicable legal & regulatory requirements and internal standards.
- We strive to employ our shareholder's capital effectively and efficiently and demonstrate honesty and integrity by applying the highest standards of ethical conduct.

A handwritten signature in grey ink, appearing to read "Brian Penney".

Brian Penney
Chief Executive Officer
March 2016

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Appendix B

Concordance Table with Applicable Permits and Licences

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B CONCORDANCE TABLE WITH APPLICABLE PERMITS AND LICENCES

The following table outlines the relevant terms and conditions regarding the operation and construction of the Project road network included in the Project's Project Certificate No. 005 - Amend. No. 1, issued by NIRB, the Type 'A' Water Licence - 2AM-MRY1325 - Amend. No. 1, issued by the NWB, and the Commercial Lease, agreed upon by Baffinland and the QIA.


Compliance to the terms and conditions included in the Tote Road *Fisheries Act* Authorization No. NU-06-0084, and subsequent amendments and authorizations for Project fish bearing water crossings, will be documented in the prescribed Annual Report(s) Baffinland provides to DFO by December 31 of each year.

TABLE B.2 CONCORDANCE WITH PROJECT CERTIFICATE (005) TERMS AND CONDITIONS

Terms and Conditions	Reference and Comments
<p><u>Condition 19</u></p> <p>The Proponent shall ensure that it develops and implements adequate monitoring and maintenance procedures to ensure that the culverts and other conduits that may be prone to blockage do not significantly hinder or alter the natural flow of water from areas associated with the proposed mine. In addition, the Proponent shall monitor, document and report the withdrawal rates for water removed and utilized for all domestic and industrial purposes.</p>	<p>Monitoring and maintenance of the Project road network, including water crossings, is discussed in Sections 3 and 5 of the Roads Management Plan.</p> <p>Withdraw rates from water sources will be monitored and reported as outlined in the Type 'A' and 'B' Water Licences.</p>
<p><u>Condition 21</u></p> <p>The Proponent shall ensure that the scope of the Aquatic Effects Monitoring Plan (AEMP) includes, at a minimum:</p> <ol style="list-style-type: none"> Monitoring of non-point sources of discharge, selection of appropriate reference sites, measure to ensure the collection of adequate baseline data and the mechanisms proposed to monitor and treat runoff, and sample sediments; and Measures for dustfall monitoring designed as follows: <ul style="list-style-type: none"> To establish a pre-trucking baseline and collect data during Project operation for comparison; To facilitate comparison with existing guidelines and potentially with thresholds to be established using studies of Arctic char egg survival and/or other studies recommended by the Terrestrial Environment Working Group (TEWG); and, To assess the seasonal deposition (rates, quantities) and chemical composition of dust entering aquatic systems along representative distance transects at right angles to the Tote Road and radiating outward from Milne Port and the Mine Site. 	<p>Addressed by the Project's AEMP and Air Quality and Noise Abatement Management Plan.</p>

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Terms and Conditions	Reference and Comments
<p><u>Condition 22</u></p> <p>The Proponent shall develop a detailed Sediment and Erosion Management Plan to prevent and/or mitigate sediment loading into surface water within the Project area.</p>	<p>Addressed by the Project's Surface Water and Aquatic Ecosystem Management Plan.</p> <p>Sediment and erosion management measures used at the Project are discussed in Section 3 of this Plan.</p>
<p><u>Condition 25</u></p> <p>The Proponent shall undertake the additional geotechnical investigations to identify sensitive landforms, modify engineering design for Project infrastructure, develop and implement preventative and/or mitigation and monitoring measures to minimize the impacts of the Project's activities and infrastructure on sensitive landforms.</p>	<p>Baffinland will continue to conduct geotechnical drilling programs and assessments to inform the design, construction and operation of Project infrastructure. Construction considerations for permafrost sensitive areas along the Tote Road, are discussed in Section 3 of the Roads Management Plan.</p> <p>Biannual geotechnical inspections, prescribed by the Type 'A' Water Licence, are discussed in Section 5 of this Plan.</p>
<p><u>Condition 26</u></p> <p>The Proponent shall develop and implement a comprehensive erosion management plan to prevent or minimize the effects of destabilization and erosion that may occur due to the Project's construction and operation.</p>	<p>Addressed by the Project's Surface Water and Aquatic Ecosystem Management Plan.</p> <p>Sediment and erosion management measures used at the Project are discussed in Section 3 of this Plan.</p>
<p><u>Condition 28</u></p> <p>The Proponent shall monitor the effects of the Project on the permafrost along the railway and all other Project affected areas and must implement effective preventative measures to ensure that the integrity of the permafrost is maintained.</p>	<p>Baffinland will continue to conduct geotechnical drilling programs and assessments to inform the design, construction and operation of Project infrastructure. Construction considerations for permafrost sensitive areas along the Tote Road, are discussed in Section 3 of this Plan.</p>
<p><u>Condition 29</u></p> <p>The Proponent shall provide to the respective regulatory authorities, for review and acceptance, for-construction engineering design and drawings, specifications and engineering analysis to support design in advance for constructing those facilities. Once project facilities are constructed, the Proponent shall provide copies of the as-built drawings and design to the appropriate regulatory authorities.</p>	<p>Design and construction documentation for Project infrastructure will be provided to regulators and stakeholders as prescribed by the Type 'A' Water Licence, TRAN process (Appendix D) and <i>Fisheries Act</i>.</p>

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Terms and Conditions	Reference and Comments
<u>Condition 43</u> Prior to the start of construction, the Proponent must submit a Site Drainage and Silt Control Plan to the appropriate regulatory authorities for approval.	Addressed by the Project's Surface Water and Aquatic Ecosystem Management Plan.
<u>Condition 45</u> The Proponent shall adhere to the No-Net-Loss principle at all phases of the project to prevent or mitigate direct or indirect fish and fish habitat losses.	Adherence to the No-Net-Loss principle will be assessed and documented in the prescribed reports provided to DFO for the Project's Fisheries Act Authorizations.
<u>Condition 47</u> The Proponent shall ensure that all Project infrastructure in watercourses are designed and constructed in such a manner that they do not unduly prevent and limit the movement of water in fish bearing streams and rivers.	Project infrastructure in watercourses will be designed to the specifications outlined the Project's most current Civil Design Criteria document. Monitoring of Project water crossings is discussed in Section 3 and Appendix D of the SWAEMP.

NOTE:

1. Project Certificate No. 005 terms and conditions regarding dust and air quality are addressed in the Project's Air Quality and Noise Abatement Management Plan.


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TABLE B.2 CONCORDANCE TABLE WITH TYPE A WATER LICENCE (2AM-MRY1325) CONDITIONS

<u>Part D, Item 1</u> All final design and construction drawings shall be stamped and signed by a Professional Engineer.	Issued-for-Construction (IFC) drawings provided to regulators and stakeholders for Project infrastructure will be stamped and signed by a Professional Engineer registered in Nunavut.
<u>Part D, Item 3</u> Quarrying activities shall be conducted in accordance with all applicable legislation, guidelines and industry standards including the Northern Land Use Guidelines, Pits and Quarries (INAC, 2009).	Project quarrying activities will adhere to the Project's Borrow Pit and Quarry Management Plan.
<u>Part D, Item 4</u> The Licensee shall implement sediment and erosion control measures, as required, prior to and during all Phases of the Mary River Project to prevent and/or minimize sediment loading into Water.	Sediment and erosion management measures used at the Project are discussed in Section 3 of this Plan, with additional details provided in the SWAEMP.
<u>Part D, Item 8</u> The Licensee shall implement preventive and mitigation measures to prevent any wastes associated with the undertaking from entering any Water bodies.	General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 3 and Appendix D of the SWAEMP.
<u>Part D, Item 9</u> The Licensee shall locate equipment storage areas on gravel, sand or other durable land, at a distance of at least thirty-one (31) metres above the ordinary High Water Mark of any Water body in order to minimize impacts on surface drainage and Water quality.	General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 3 and Appendix D of the SWAEMP.
<u>Part D, Item 10</u> The Licensee shall minimize disturbance to terrain, permafrost and drainage during movement of contractors' equipment and personnel around the site, including the railway corridor, during all phases of the Project.	During the design of Project infrastructure, including the Project road network, landforms, permafrost and archaeological resources will be surveyed and taken into account. Design and construction considerations are discussed in Section 3.3 of this Plan.
<u>Part D, Item 11</u> The Licensee shall not store material on the surface of frozen streams or lakes except what is required for immediate use.	Baffinland will not store material on the surface of frozen streams or lakes except what is required for immediate use.

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<p><u>Part D, Item 12</u></p> <p>The Licensee shall use fill material for construction from approved sources that have been demonstrated by appropriate geochemical analyses to not possess Acid-Generating and Metal Leaching properties.</p>	<p>Material used for construction and operation of the Project road network will be sourced from approved quarries and borrow sources outlined in the Project's Borrow Pit and Quarry Management Plan. The use of material from unconventional quarry and/or borrow locations along the Tote Road (e.g. opportunistic use of materials from cuts made to support changes to the Project road network) will follow the protocols outlined in the Milne Inlet Tote Road Quarry and Borrow Source Management Plan. Blasted material used by the Project will be demonstrated to be non-acid generating and non-metal leaching.</p>
<p><u>Part D, Item 15</u></p> <p>All surface runoff during all phases of the Project, where flow may directly or indirectly enter a Water body, shall be sampled Weekly and not exceed the following Effluent quality limits (refer to Table 1).</p>	<p>Surface water monitoring programs for the Project are discussed in the SWAEMP and AEMP.</p>
<p><u>Part D, Item 16</u></p> <p>The Licensee shall supervise and field check through an appropriately qualified Engineer, all construction of Engineered Structures in such a manner that the Project specification can be enforced, and where required, the quality control measures followed.</p>	<p>Significant Project road network changes, including changes that trigger the TRAN process and/or Water Licence Modification process, will be included in the biannual geotechnical inspections prescribed by the Type 'A' Water Licence (Part D, Item 18; Part I, Item 13). Construction will be supervised by qualified personnel.</p>
<p><u>Part D, Item 18</u></p> <p>The Licensee shall conduct inspections of earthworks and geological and hydrological regimes of the Project Biannually during the summer or as otherwise approved by the Board in writing. The inspection shall be conducted by a Geotechnical Engineer and the inspection report shall be submitted to the Board within sixty (60) days of the inspection, including a cover letter from the Licensee outlining an implementation plan to respond to the Engineer's recommendations.</p>	<p>Discussed in Section 5 of this Plan.</p>
<p><u>Part D, Item 19</u></p> <p>The Licensee shall prevent any chemicals, fuel or wastes associated with the undertaking from entering any Water body.</p>	<p>General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 4 and Appendix D of the SWAEMP.</p>
<p><u>Part D, Item 21</u></p> <p>The Licensee shall undertake necessary corrective measures to mitigate impact on surface drainage resulting from the Licensee's activities.</p>	<p>General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 3 and Appendix D of the SWAEMP.</p>

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<u>Part D, Item 22</u> For the purposes of culvert and bridge installations, the Licensee shall not encroach on the natural channel width by the placement of abutments, footings or armoring below the ordinary High Water Mark.	Design and construction considerations for Project water crossings are discussed in Section 3 and Appendix D of the SWAEMP.
<u>Part D, Item 23</u> The Licensee shall construct and operate all infrastructure and facilities authorized by the Board that are designed to contain, withhold, divert or retain Water and/or Waste, in accordance with all applicable legislation and industry standards.	Project infrastructure will be designed and constructed to the applicable standards and regulations outlined in the Project's approved Civil Design Criteria document, and subsequent amendments.
<u>Part D, Item 25</u> The Licensee shall prevent the deposition of debris or sediment from entering into or onto any Water body, with respect to the construction of access roads, site laydown pads and areas or other earthworks. These materials shall be disposed of at a distance of at least thirty one (31) metres from the ordinary High Water Mark in such a manner that they do not enter the Water.	General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 3 and Appendix D of the SWAEMP.
<u>Part E, Item 12</u> The Licensee shall not remove any material from below the ordinary High Water Mark of any water body unless authorized.	Design and construction considerations for Project water crossings are discussed in Section 3 and Appendix D of the SWAEMP.
<u>Part E, Item 13</u> The Licensee shall not cause erosion to the banks of any body of Water and shall provide necessary controls to prevent such erosion.	General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 3 and Appendix D of the SWAEMP.
<u>Part E, Item 17</u> The Licensee shall designate an area for the deposition of excavated and stockpiled materials that is at least thirty-one (31) metres above the ordinary High Water Mark of any water body.	General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 3 and Appendix D of the SWAEMP.
<u>Part E, Item 18</u> The Licensee shall not cut any stream bank or remove any material from below the ordinary High Water Mark of any Water body.	Design and construction considerations for Project water crossings are discussed in Section 3 and Appendix D of the SWAEMP.
<u>Part E, Item 19</u> The Licensee shall undertake appropriate corrective measures to mitigate impacts on surface drainage resulting from the Licensee's operations.	General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 3 and Appendix D of the SWAEMP.

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<u>Part E, Item 20</u> <p>The Licensee shall limit any in-stream activity, as much as possible, to low Water periods. In-stream activity is prohibited during fish migration.</p>	<p>To limit in-water work, 56construction of roads and the installation/modification of Project water crossings will occur during the winter months, when practical. Discussed in Section 3 of this Plan.</p>
<u>Part E, Item 21</u> <p>The Licensee shall locate stream crossings to minimize approach grades. Approaches shall be stabilized during construction and upon completion of Project activities, to control runoff, erosion and subsequent siltation to any Water body.</p>	<p>Design and construction considerations and mitigation measures for Project water crossings are discussed in Section 3 and Appendix D of the SWAEMP.</p>
<u>Part E, Item 22</u> <p>The Licensee shall not permit machinery to travel up the stream bed and fording of any Water body is to be kept to a minimum and limited to one area. Equipment used should be well cleaned and free of oil and grease and maintained free of fluid leaks.</p>	<p>General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 3 and Appendix D of the SWAEMP. Construction of roads and the installation/modification of Project water crossings will occur during the winter months, whenever practical, in order to minimize in water work and mitigate potential associated impacts.</p>
<u>Part E, Item 23</u> <p>The Licensee shall provide to the Board for review, for-construction design drawings for stream culverts, bridges and any other structures, which may impact the quantity, quality and flow of water, at least thirty (30) days prior to construction.</p>	<p>Issued-for-construction drawings will be provided for Project road network changes that trigger the TRAN process and/or Water Licence Modification process.</p>
<u>Part G - Modifications (refer to Type 'A' Water Licence)</u>	<p>Water Licence Modifications will be submitted to the NWB for approval as required. Requirements for Water Licence Modifications are discussed in Appendix D of this Plan.</p>
<u>Part G, Item 13</u> <p>The Licensee shall submit to the Board, within sixty (60) days of completion of the geotechnical inspection referred to in Part I, Item 12, a Geotechnical Engineer's Report that shall include a cover letter from the Licensee outlining an implementation plan to address the recommendations of the Geotechnical Engineer.</p>	<p>Discussed in Appendix D of the SWAEMP.</p>
<u>Part G, Item 15</u> <p>The Licensee shall obtain a digital photographic record of all the watercourse crossings before, during, and after the completion of construction as required under Schedule D, Item 1.</p>	<p>Photographs will be taken before, during and after construction of Project water crossings, as outlined in Appendix D of the SWAEMP.</p>

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Part J, Item 8

The Licensee shall, unless otherwise identified within the approved Plan under Part J, Item 1, and/or Part J, Item 2 remove all culverts and open the natural drainage channel. In carrying out this activity, measures shall be implemented to minimize erosion and sedimentation.

Closure and removal of water crossings will be conducted as outlined in the Project's Interim Closure and Reclamation Management Plan.



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TABLE B.3 CONCORDANCE WITH COMMERCIAL LEASE TERMS AND CONDITIONS

<p><u>Section 2.5 - Permitted Activities and Use</u></p> <p>(refer to Commercial Lease)</p>	Applicability discussed in Appendix D of this Plan.
<p><u>Section 2.8 - Tote Road Alignment</u></p> <p>The Tenant shall obtain written consent from the Landlord for any adjustments to the Milne Inlet Tote Road, such consent not to be unreasonably withheld. The parties acknowledge that adjustments to the alignment of the Milne Inlet Tote Road may be required to facilitate safe haul truck travel. In such event, the Tenant shall take all necessary or desirable steps to avoid or limit the Environmental Impacts and/or Environmental Damage caused by or incidental to such work, including, without limitation, avoiding disturbance to existing Lands and waters and returning any abandoned section of the Milne Inlet Tote Road to a condition that is consistent with the natural environment. The Tenant shall pay the Landlord in accordance with a Quarry Concession Agreement the applicable fees for any Specified Substances or other materials taken by the Tenant from any Lands, including the Milne Inlet Tote Road (except for surface granular material and waste rock from Operations as provided for in Subsection 2.7 (b)).</p>	Discussed in Section 3.2 and Appendix D of this Plan.
<p><u>Section 3.1 - Land Classification Amendment Option</u></p> <p>The Landlord hereby grants to the Tenant the right and option (the “Land Classification Amendment Option”) to seek amendments to re-classify specified Lands within Land Use Area(s), but subject always to any right, title or interest that the Landlord may have granted to any third parties with respect to Lands in the General Areas of the Property that have not already been designated an Impact Area or Exploration Area. The Tenant may exercise the Land Classification Amendment Option with the prior written consent of the Landlord, which consent may not be unreasonably withheld, pursuant to the procedures set forth in this Article 3. If the Landlord consents to an Option Exercise Notice pursuant to Section 3.3 or if the Tenant surrenders a part or parts of the Property pursuant to Section 3.7. then the amount of Rent payable pursuant to Section 4.1 shall be adjusted in accordance with Section 4.5.</p>	Discussed in Section 3.2 and Appendix D of this Plan.
<p><u>Section 3.2 - Options Exercise Notice</u></p> <p>The Tenant may exercise the Land Classification Amendment Option by delivering to the Landlord an “Option Exercise Notice”. An Option Exercise Notice may be submitted without cost to the Tenant with its annual Work Plan pursuant to Section 6.1 provided that if not submitted with a Work Plan at the time specified in Section 6.1 the Tenant shall pay the Landlord a reasonable processing fee, as determined by the Landlord, acting reasonably, to compensate the Landlord for its costs of the additional review process.</p>	Discussed in Section 3.2 and Appendix D of this Plan.

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Appendix C

Tote Road Adjustment Notification Lease Operations Guide

Commercial Lease No.: Q13C301

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Background

BIMC is required to follow this procedure for any adjustment to the design of the Tote Road submitted to QIA. Under Section 2.8 of the Commercial Lease:

“The Tenant shall obtain written consent from the Landlord for any adjustments to the Milne Inlet Tote Road, such consent not to be unreasonably withheld. The parties acknowledge that adjustments to the alignment of the Milne Inlet Tote Road may be required to facilitate safe haul truck travel.”

Calendar of activities

BIMC submits Tote Road Adjustment Notification (TRAN)	TRANs can be submitted at any time as required by BIMC; it is expected that they will typically be submitted by November 1 with the Annual Work Plan or by March 1 as a follow-up to the Annual Work Plan.
QIA reviews TRAN	TRAN review timelines are described in detail below.
QIA submits Notice of Consent or Rejection	Once QIA has reached a decision, an approval or rejection of the TRAN application will be issued to BIMC as per the timelines described below.

Submission requirements


The TRAN Application Form is to be used by BIMC when submitting any and all TRANs (see Appendix A).

A TRAN is required when the following changes are being made to the Tote Road:

- A re-alignment of the Tote Road where the centre line of the road is moved >10 metre (m) from the existing centre line.
- Addition of another lane to the Tote Road.
- Raising the existing grade of the Tote Road by >2 m in elevation.
- Lowering the existing grade of the Tote Road in areas that have historically been prone to permafrost degradation.
 - o Areas along the Tote Road that have historically been prone to permafrost degradation as a result of cuts and the lowering of road grade are outlined in Table 1. When lowering the existing grade of the Tote Road within these areas (Table 1), the potential impact on permafrost will be evaluated and where the potential for degradation exists, the submission of a TRAN will be required.
- Lowering the existing grade of the Tote Road by >1 m in areas not identified in Table 1.
- Changing the design of an existing bridge or culvert. Upgrading an existing bridge or culvert to the approved design (e.g. IFC drawings included in the ERP approvals) will not require the submission of a TRAN.

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- A re-alignment of the Tote Road that results in the placement of material within 31 metres of the High Water Mark of a natural water body.

For the purposes of the TRAN process, the Tote Road is defined as the main transport corridor starting at approx. Km 2.5 (N 71° 52' 02.3" W 80° 52' 51.1") near Milne Port and terminating at Km 100 (N 71° 19' 44.3" W 79° 22' 24.6") near the Mine Site.

Adjustments to the Tote Road, as well as all Project roadways and infrastructure, must fall within the limits of the Impact Areas outlined in the Commercial Lease. A 50 m buffer of undisturbed land must also be maintained between infrastructure and disturbed areas associated with the Project and the established limits for Impact Areas outlined in the Commercial Lease. Adjustments to the Tote Road that encroach (within 50 m) or fall outside the limits of the Impact Areas will need to be approved by the QIA through the Options Exercise Notice (OEN) process.

Issued for Construction (IFC) drawings shall be included for any engineered structure (e.g. bridges, culverts) that deviates in physical characteristics from the existing approved design. For water crossing locations where IFC and supporting specifications do not currently exist or were not previously submitted for approval, this information will be provided with the TRAN submission for approval.


Routine maintenance and minor upgrades to the existing road surface, crossings, embankments or safety structures (barriers, signage, etc) are part of normal operations and will not require submission or review of a TRAN. As defined by the Nunavut Water Board¹ (NWB), "Routine Maintenance" is considered to encompass actions that BIMC may take to ensure that the Tote Road is in an acceptable condition (from a safety and operational perspective) to facilitate its intended use. Examples of routine maintenance include but are not limited to; grading, re-decking of bridges, and replacement of existing culverts consistent with their approved design. The term "Minor Upgrade" means upgrades that do not significantly alter the structure or makeup of the road. Examples of minor upgrades include but are not limited to; adding a shoulder to a section of road, and modifying the radius/turns of sections of the road for safety purposes. Adding another lane to the Tote Road would not be considered a minor upgrade.

Upgrades to the Tote Road that are completed to the approved design drawings submitted as part of the Project Description for the Early Revenue Phase (ERP) approvals, including the Project Certificate Amendment and Type 'A' Water Licence, are considered to be already approved and will not require the submission TRAN or additional QIA approval.

Table 1 – Permafrost Sensitive Areas along the Tote Road

Tote Road Areas requiring a Permafrost Assessment for Work involving Cuts and/or Lowering of Road Grade
Km 50 - 64
Km 70 - 100

¹ Nunavut Water Board (2015) Commitment No. 2 – List of Commitments Generated during the Technical Meeting and Pre-Hearing Conference for the Mary River Project Amendment No. 1 Application to Licence 2AM- MRY1325. February 25, 2015.

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Approval process

Upon receiving the TRAN, QIA will review it for completeness and notify BIMC if any additional information is required within fourteen (14) days. If no additional information required, then within thirty (30) days of the submission date, QIA will provide BIMC with a Notice granting its consent, consent with conditions or its rejection of the submission with reasonable grounds.

If additional information is required, then within thirty (30) days of receipt of additional information or within sixty (60) days of the submission of the TRAN, *whichever occurs later*, QIA will provide BIMC with a Notice granting its consent, consent with conditions or its rejection of the submission with reasonable grounds.

Where any adjustments of the Tote Road encroach (within 50 m) or fall outside the limits of the Impact Areas defined in Commercial Lease, an Options Exercise Notice (OEN) will be submitted together with the TRAN application. Where an OEN is required, timelines for review will be superseded by those outlined in Section 3.3 of the Commercial Lease and the *Lease Operations Guide for Options Exercise Notice*.

If the TRAN is submitted with the Annual Work Plan, where permissible, QIA will review the TRAN application in coordination with the review of the Work Plan and no additional processing fees will be applied. If the TRAN is submitted outside the Annual Work Plan, BIMC will be charged a reasonable processing fee by QIA to process the application. If the TRAN is submitted with an OEN, the reasonable processing fee should be inclusive of both applications and not duplicative.


Fast track option

If BIMC wishes to fast track a TRAN application, it will provide the complete TRAN application and a rationale as to why the fast track option is being pursued. QIA will respond within five (5) business days as to whether the fast track option may be acceptable, along with an estimate of time to process the TRAN.


In particular, fast tracking of TRANs will be considered for simpler applications; this will be determined on a case by case basis. Fast tracking is not preferred by BIMC or QIA and will not be guaranteed to be entered into upon request.

Follow-up Reporting

Within 90 days of completion of the construction of a Tote Road Adjustment, Baffinland will provide QIA with a summary report of activities including before and after pictures. As-built documentation will be provided to QIA for Project road network changes that required the submission of IFC drawings to obtain the necessary approvals (e.g. TRAN). The Annual Report required by the Commercial Lease will also include a summary of any Tote Road Adjustments completed and an updated map of the Tote Road, if applicable. Through annual use and

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submission of Photosat (or equivalent aerial imagery and survey), BIMC will reconcile additional disturbed areas with respect to reclamation securities. Such satellite imagery will also be utilized to develop plan view as-built drawings for Project road network changes. Cross-sections for water crossing changes (e.g. bridges and culverts) will be provided, and additional cross sections may also be provided as required by QIA. As-built drawings will be signed and stamped by a Professional Engineer registered in Nunavut.

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Attachment 1 – TRAN APPLICATION FORM

#	<u>TRAN Application Form</u>	
	<p>The Tote Road Adjustment Notice (TRAN) Application Form is to be used to satisfy Section 2.8 of the Commercial Lease². Routine Maintenance, considered to encompass actions BIMC may take to ensure that the Tote Road is in an acceptable condition (from a safety and operational perspective) to facilitate its intended use, does not require a TRAN. A TRAN is required when the following changes are being made to the Tote Road:</p> <ul style="list-style-type: none"> • A re-alignment of the Tote Road where the centre line of the road is moved > 10 m from the existing centre line. • Addition of an independent lane to the Tote Road (e.g. doubling a section of road). • Raising the existing grade of the Tote Road by >2 m in elevation. • Lowering the existing grade of the Tote Road in areas that have historically been prone to permafrost degradation. <ul style="list-style-type: none"> o Areas along the Tote Road that have historically been prone to permafrost degradation as a result of cuts and the lowering of road grade are outlined in Table 1 (refer above). When lowering the existing grade of the Tote Road within these areas, the potential impact on permafrost will be evaluated and where the potential for degradation exists, the submission a TRAN will be required. • Lowering the existing grade of the Tote Road by >1 m in areas not identified in Table 1 (refer above). • Changing the design of an existing bridge or culvert. Upgrading an existing bridge or culvert to the approved design (e.g. IFC drawings included in the ERP approvals) does not require the submission of a TRAN. • A re-alignment of the Tote Road that results in the placement of material within 31 metres of the High Water Mark of a natural water body. <p>For the purposes of the TRAN process, the Tote Road is defined as the main transport corridor starting at approx. Km 2.5 (N 71° 52' 02.3" W 80° 52' 51.1") near Milne Port and terminating at Km 100 (N 71° 19' 44.3" W 79° 22' 24.6") near the Mine Site.</p> <p>If unsure of whether work is considered Routine Maintenance or an Adjustment, a completed TRAN should be submitted to QIA for clarification.</p>	
1	TRAN Title / Identification	
2	Approximate Km marker(s) on the Tote Road and general geographic UTM coordinates of the areas subject to the proposed Tote Road Adjustment.	
3	A description of the characteristics of the land and water that will be impacted. ³	
4	The proposed work activities to be conducted (associated maps, drawings and designs to be attached). Issued for Construction (IFC) drawings shall be included for any engineered structure (e.g. bridges, culverts).	

² QIA and BIMC (2013) Commercial Lease No. Q13C301. September 6, 2013.

³ This description shall at a minimum include a description of the following components:

- i. Disturbed or undisturbed
- ii. Wildlife
- iii. Vegetation
- iv. Permafrost
- v. Water quality
- vi. Archeology / carving stone presence.

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5	Proposed schedule of the activities.	
6	The reason for the adjustment and if any new operations or activities will be conducted on the land (e.g., crushing plant).	
7	Applicable Environmental Management and Monitoring Plans.	
8	Confirmation that the Tote Road Adjustment area is within the limits of the Impact Areas identified in the Commercial Lease (including 50 m buffer) and the Project Development Area. ⁴	
9	List all regulatory approvals required for the adjustments. Indicating the status of each and whether any changes are required to existing approvals, licences, plans, permits or authorizations (i.e. DFO, etc.).	
10	Indicate the source and volume of Specified Substances associated with the Tote Road adjustment. Where applicable, provide the name of Quarry, Quarry Management Plan, version and approval date associated with the Specified Substances to be used.	
11	Adjustment to current closure/reclamation security or confirmation that the required amount of security is in place.	
12	Indicate if this work is reclamation or closure based.	
13	If yes, indicate any reclamation work to be conducted as part of the proposed Tote Road Adjustment. ⁵	

⁴ Confirmation will, at a minimum, include a map presenting pre-construction conditions, the limits of the relevant Impact Areas identified in the Commercial Lease and the limits of the proposed Tote Road Adjustment. A map presenting the post-construction conditions, the limits of the relevant Impact Areas identified in the Commercial Lease and the as-built limits of the Tote Road Adjustment will be submitted to the QIA within 90 days of construction completion.

⁵ Pursuant to Section 3.6 and 9.7 of the Commercial Lease, this description is intended to provide confirmation of a plan to complete or completed work with the eventual intent of requesting QIA to release the relevant portion of security deposit. QIA reserves the ability to request additional information prior to issuing a Letter of Clearance.

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Appendix D

Options Exercise Notice Lease Operations Guide

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Background

BIMC is required to follow this procedure for any and all Option Exercise Notices (OENs) submitted to QIA.

Calendar of activities

BIMC submits OEN	OENs can be submitted at any time as required by BIMC; it is expected that they will typically be submitted by November 1 with the Annual Work Plan.
QIA reviews OEN	OEN review timelines are described in detail below.
QIA submits Notice of Consent or Rejection	Once QIA has reached a decision an approval or rejection of the OEN application will be issued to BIMC as per the timelines described below. If the OEN seeks to reclassify or surrender lands QIA will issue a Letter of Clearance along with the Notice of consent (if consent is granted), specifying QIA's conditions for approval.

Submission requirements


A standardized OEN Application Form is to be used by BIMC when submitting any and all OENs (see Appendix A).

If the OEN seeks to surrender lands the application must also include:

- The results from a Canada Land Survey that certifies the boundaries of each Land Use Area to be surrendered. This will include copies of all survey data, digital files and surveyors' notes. The plans of survey will include the aggregate number of hectares comprising each Land Use Area and the location and size of all Waste Storage Areas and quarry sites; and
- In the case of surrendering Impact Areas and Exploration Areas, evidence that closure objectives and criteria are met according to the requirements of a Closure and Reclamation Plan (CRP).

Approval process

Upon receiving the OEN, QIA will review it for completeness and notify BIMC if any additional information is required within sixty (60) days. If no additional information required, then within ninety (90) days of the submission date, QIA provides BIMC with a Notice granting its consent, consent with conditions, or its rejection of the submission with reasonable grounds.

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If additional information is required, then within thirty (30) days of receipt of said information or within ninety (90) days of the submission of the OEN, *whichever occurs later*, QIA provides BIMC with a Notice granting its consent, consent with conditions or its rejection of the submission with reasonable grounds.

If submitted with the Annual Work Plan, where permissible, QIA will aim to review the OEN application in coordination with the Work Plan.

Fast track option

If BIMC wishes to fast track an OEN application, it will provide the complete OEN application and a rationale as to why the fast track option is being pursued. QIA will respond within five (5) business days as to whether the fast track option may be acceptable, along with an estimate of time to process the OEN.

In particular, fast tracking of OENs will be considered for simpler applications; this will be determined on a case by case basis. Fast tracking is not preferred by QIA and will not be guaranteed to be entered into upon request.

Surrender of Impact Areas and Exploration Areas


The surrender of Impact Areas and Exploration Areas may occur only after the final completion of all Work, activities and requirements of a Closure and Reclamation Plan for such part or parts of the Lands to be surrendered, to the reasonable satisfaction¹ of the Landlord in accordance with a Letter of Clearance, which may include monitoring obligations following surrender of the subject Lands.

If the lands have not been reclaimed to QIA's satisfaction, the Letter of Clearance will not permit the Lands to be surrendered and will either retain the classification of Impact and/or Exploration Areas or reclassify the lands to General Areas. In the latter case, the Letter of Clearance may also contain ongoing monitoring requirements.

Surrender of General Areas

The approval process for the surrender of General Areas Lands requires QIA to submit the OEN submission to QIA with the requirements listed above. Once the Canada Land Survey results are received by QIA then the Lands are deemed to be surrendered – no approval process is required.

¹ As defined in Section 3. Land Classifications Amendments of the Lease.

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APPENDIX A – OEN APPLICATION FORM

#	<u>OEN Application Form</u>	
1	OEN Title	
2	General geographic UTM coordinates of the areas subject to amendment	
3	A description of the characteristics of the land including acknowledgement and explanation of any environmental sensitivities ²	
4	The specific nature of activities that have historically occurred on the proposed Lands ³	
5	The specific nature of activities to be conducted on the proposed Lands ⁴	
6	Proposed duration of the activities	
7	Associated changes to all Environmental Management and Monitoring Plans ⁵	
8	All related Annual Work Plan amendments, if any ⁶	

² This description shall at a minimum include a complete description of the following components:

- i. Wildlife
- ii. Vegetation
- iii. Permafrost
- iv. Water quality (includes Acid Rock Drainage and Metal Leaching)
- v. Air quality
- vi. Associated map(s), sketches and other information in sufficient detail and in a scale as to QIA to consider the amendment request, including clear presentation of existing geographical features and relevant project facilities. The map(s) will include nearby facilities and geographical features (e.g. water bodies, topography).
- vii. Photographic record of pre-operations in the OEN area.

³ Indicate whether lands are disturbed or undisturbed - if disturbed, nature and duration of past disturbance (e.g. hectares of land disturbed, tonnes of material quarried, other types of activities etc.)


⁴ Associated drawings and designs are to be included as annexes.

⁵ Relevant environmental management plans associated with the OEN. If there are no revisions required to management plans, a list of the most current environmental management plans will be provided.

⁶ Indicate whether activity is outside of scope of relevant Annual Work Plan.

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9	Relevant information concerning financial security, including the Security Deposit.	
10	Indicate whether changes are required to existing approvals, licences, plans, permits or authorizations.	
11	The anticipated increase or decrease in Rent payment where the increase or decrease is shown compared against the initial Rent payment amount pre-OEN approval.	

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Appendix E

Regulatory Requirements for Changes to Protect Roads and Water Crossings

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E REGULATORY REQUIREMENTS FOR CHANGES TO PROJECT ROADS AND WATER CROSSINGS

The following subsections discuss the key regulatory requirements, terms and conditions for changes to Projects roads and/or water crossings.

E.1 COMMERCIAL LEASE

Section 2.8 - Tote Road Alignment of the Commercial Lease states the following:

The Tenant shall obtain written consent from the Landlord for any adjustments to the Milne Inlet Tote Road, such consent not to be unreasonably withheld. The parties acknowledge that adjustments to the alignment of the Milne Inlet Tote Road may be required to facilitate safe haul truck travel.

To provide additional clarity on the condition above, Baffinland and QIA developed the Tote Road Adjustment Notification (TRAN) in 2018. In summary, a TRAN is required to be submitted to and approved by the QIA when changes are being made to the Tote Road that include one or more of the following:

- A re-alignment of the Tote Road where the centre line of the road is moved > 10 metre (m) from the existing centre line.
- Addition of another lane to the Tote Road.
- Raising the existing grade of the Tote Road by > 2 m in elevation.
- Lowering the existing grade of the Tote Road in areas that have historically been prone to permafrost degradation.
 - o Areas along the Tote Road that have historically been prone to permafrost degradation as a result of cuts and the lowering of road grade are outlined in Table E.1. When lowering the existing grade of the Tote Road within these areas (Table F.1), the potential impact on permafrost will be evaluated and where the potential for degradation exists, the submission of a TRAN will be required.
- Lowering the existing grade of the Tote Road by > 1 m in areas not identified in Table E.1.
- Changing the design of an existing bridge or culvert. Upgrading an existing bridge or culvert to the approved design (e.g. IFC drawings included in the ERP approvals) will not require the submission of a TRAN.
- A re-alignment of the Tote Road that results in the placement of material within 31 metres of the High Water Mark of a natural water body.


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TABLE E.3 PERMAFROST SENSITIVE AREAS ALONG THE TOTE ROAD

Tote Road Areas Requiring a Permafrost Assessment for Work Involving Cuts and/or Lowering of Road Grade
Km 50 - 64
Km 70 - 100

For the purposes of defining a 'Tote Road adjustment' under the Commercial Lease, the Tote Road is defined as the main transport corridor starting at approx. Km 2.5 (N 71° 52' 02.3" W 80° 52' 51.1") near Milne Port and terminating at Km 100 (N 71° 19' 44.3" W 79° 22' 24.6") near the Mine Site. Changes to the Project road network outside the defined Tote Road will not require the submission of a TRAN.

A copy of the TRAN is provided in Appendix C of this Plan.

Other relevant requirements under the Commercial Lease for changes to the Project road network include the following:

Section 2.5 - Impact Areas of the Commercial Lease states the following:


To the greatest extent possible, and subject to the requirements of any Environmental Management and Monitoring Plan, no activities or uses permitted within an Impact Area may occur on Lands that are within one hundred (100) meters of the surveyed boundary of the Property or within fifty (50) meters of the surveyed boundary of the Impact Area and any adjoining Land Use Area, and no activities shall take place within thirty (30) meters of the ordinary high water mark of any bed or body of water anywhere within the Impact Area unless approved by the Landlord;

Section 3.1 - Land Classification Amendment Option of the Commercial Lease states the following:

The Landlord hereby grants to the Tenant the right and option (the "Land Classification Amendment Option") to seek amendments to re-classify specified Lands within Land Use Area(s), but subject always to any right, title or interest that the Landlord may have granted to any third parties with respect to Lands in the General Areas of the Property that have not already been designated an Impact Area or Exploration Area. The Tenant may exercise the Land Classification Amendment Option with the prior written consent of the Landlord, which consent may not be unreasonably withheld, pursuant to the procedures set forth in this Article 3. If the Landlord consents to an Option Exercise Notice.

Section 3.2 - Options Exercise Notice of the Commercial Lease states the following:

The Tenant may exercise the Land Classification Amendment Option by delivering to the Landlord an "Option Exercise Notice".

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Changes to the Project road network shall be within the limits of the Impact Areas outlined in Commercial Lease and shall ensure a 50-meter buffer of undisturbed land is maintained between the Impact Area limits and the limits of infrastructure and disturbed areas associated with the Project. If required changes to the Project road network cannot not comply with the conditions above, an Options Exercise Notice (OEN) will be submitted to the QIA for review and approval, outlining the proposed new Impact Area limits, inclusive of the 50 m buffer of undisturbed land. Following the completion of the works associated with the OEN, a survey of the revised limits for the affected Impact Areas shall be prepared by a Canada Land Surveyor and provided to the QIA.

E.2 TYPE 'A' WATER LICENCE


The Type 'A' Water Licence includes multiple terms and conditions for the construction and operation of water management infrastructure at the Project. As such Baffinland employees and Contractors shall consult the Baffinland Sustainable Development department on the necessary regulatory approvals required to complete changes to Project roads and/or water crossings. Significant changes to Project roads and water crossings may require the submission of a modification application under Section G of the Type 'A' Water Licence.

Information required to support a Water Licence Modification application under the Type 'A' Water Licence includes:

- A description of the facilities and/or works be constructed;
- The proposed location of the structure(s);
- Identification of any potential impacts to the receiving environment;
- A description of any monitoring required, including sampling locations, parameters measured and frequencies of sampling;
- Schedule for construction;
- Drawings of engineered structures stamped by a Professional Engineer; and
- Proposed sediment and erosion control measures.

E.3 FISHERIES ACT

The federal *Fisheries Act* prohibits the harmful alteration, disruption or destruction of fish habitat. As such, Baffinland's Sustainable Development department shall be consulted on any changes to the Project road network and/or water crossings to determine the necessary regulatory approvals required. New water crossings and/or significant changes to existing crossings may require fisheries authorizations and approvals from DFO.


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Appendix F

Tote Road Monitoring Program

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1. Purpose and Scope

The Tote Road Monitoring Program (TRMP) has been developed to monitor the water quality of surface water flows at select water crossing (culverts, bridges) along the Milne Inlet Tote Road (Tote Road), with a primary focus on monitoring total suspended solids (TSS) concentrations upstream and downstream of Tote Road water crossings.

Monitoring data collected under the TRMP will be used to:

- Inform Project operations of potential water quality impacts from Project activities at water crossings along the Tote Road.
- Guide and prioritize Tote Road maintenance work, corrective actions and improvements projects for surface water management infrastructure;
- Adjust mitigation measures and management strategies for Project activities along the Tote Road; and,
- Expand the Project's understanding of natural water quality conditions along the Tote Road (upstream) and the natural factors that contribute to changes in surface water quality.

2. Monitored Parameters

Water quality monitoring conducted to date along the Tote Road have identified TSS as a parameter of concern. Observations indicate that sources of TSS can be both Project-related, such as construction activities, and natural, such as bank erosion and streambed scouring during high flow periods.

In addition to TSS, the TRMP will monitor for additional parameters, including metals, nutrients, oil & grease, and routine chemistry, such as dissolved anions, turbidity and total dissolved solids (TDS).

Tables D-1 and D-2 outline the field and analytical parameters that will be monitored under the TRMP.

Table D-1 – Tote Road Monitoring Program – Field Parameters

Parameter Type	Method	Units	Parameter Group
Turbidity	1	NTU	Group 1
pH	1	pH units	
Specific Conductivity	1	µS/cm	
Water Temperature	1	°C	
Dissolved Oxygen	1	mg/L, %	
Oil & Grease Sheen	2	Presence/Absence	

Notes:

¹Method 1 – *In-situ* testing using a multi-parameter water quality probe (i.e. YSI)

Method 2 – Visual inspection during water sampling event.

Table D-2 – Tote Road Monitoring Program - Analytical Parameters


Parameter Type	Method ¹	Units	Parameter Group
pH	3	pH units	Group 2
Total Suspended Solids (TSS)	3	mg/L	
Total Dissolved Solids (TSS)	3	mg/L	
Conductivity	3	µS/cm	
Oil & Grease	3	mg/L	Group 3
Hardness	3	mg/L as CaCO ₃	Group 4
Alkalinity	3	mg/L as CaCO ₃	
Chloride (Cl ⁻)	3	mg/L	
Ammonia	3	mg/L N	
Total Phosphorus	3	mg/L N	
Nitrate (NO ₃ ⁻)	3	mg/L N	
Nitrite (NO ₂)	3	mg/L N	
Dissolved Organic Carbon (DOC)	3	mg/L N	
Total Organic Carbon (TOC)	3	mg/L N	
Total and Dissolved Metals	3	mg/L	

Notes:

¹Method 3 – analytical testing of water samples by an accredited third party laboratory

3. Monitoring Methods and Equipment

Field monitored parameters will be measured using a calibrated, multi-parameter water quality probe (e.g. YSI). A visual inspection will be conducted to determine the presence or absence of sheen.

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Discrete water samples will be collected, transported and analyzed in accordance with the protocols outlined in Baffinland's Surface Water Sampling Program – Quality Assurance and Quality Control Plan (BAF-PH1-830-P16-0001; QA/QC Plan).

4. Monitoring Locations

Water crossings monitored under the TRMP have been selected to give a geographically representative sample set of water crossings for each given watershed intersected by the Tote Road (Phillips Creek, Ravn River, Mary River), presented in Figure D-1. In selecting the Tote Road water crossings within each watershed, the following factors were considered:

- Key depositional habitats downstream of the Tote Road (e.g. fish habitat);
- Areas historically prone to sedimentation events;
- Historical borrow source locations; and,
- Existing monitoring locations and programs.

Using the factors and criteria listed above, the following 20 Tote Road water crossings, presented in Table D-3, were identified as monitoring locations.

Table D-3 – Water Crossings Monitored under TRMP

Water Crossing	Watershed	Approximate Tote Road Chainage
CV167	Phillips Creek	6
CV162	Phillips Creek	8
CV128*	Phillips Creek	17
CV129	Phillips Creek	17
CV115	Phillips Creek	27
CV112	Phillips Creek	31
CV106	Phillips Creek	33
CV099*	Phillips Creek	37
CV093*	Phillips Creek	41
CV078*	Phillips Creek	51
CV071	Phillips Creek	54
CV060	Phillips Creek	58
BG50*	Ravn River	62
CV040*	Ravn River	72
BG32	Ravn River	78

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CV217*	Ravn River	80
BG30	Ravn River	84
BG24*	Mary River	87
CV001	Mary River	94
CV223	Mary River	97

Notes:

Water crossing with an asterisk (*) are HADD fish bearing water crossings.

5. Monitoring Frequency

During each year, water quality monitoring under the TRMP will commence with the start of flows and end with the freeze-up of flows. Water quality monitoring will be divided into two seasons: Freshet and Summer. Freshet will begin with the start of flows and end July 15. Summer will begin July 16 and end with the freeze-up of flows in September. Selected water crossings will be sampled weekly (4 events per month) during Freshet and monthly during the Summer.

Tables D-4 and D-5 outline the frequency of sampling events for the primary parameters (Groups 1 & 2) and additional parameters (Group 4), respectively. As shown in Tables D-4 and D-5, primary parameters will be monitored weekly during Freshet and monthly during Summer while the additional parameters will only be sampled once per season at HADD fish-bearing water crossings. Water samples will be collected for oil & grease (Group 3) during sampling events in which visible sheen is observed.

Table D-4 – Monitoring Frequency for Primary Parameters (Groups 1 & 2)¹

Month	May				June				July				August				September			
All Water Crossings	F	F	F	F	F	F	F	F	F	F		S			S				S	

Notes:


F – Indicates Freshet water sampling event

S – Indicates Summer water sampling event

¹Water samples for Group 3 (oil & grease) will be collected where visible sheen is observed.

Table D-5 – Monitoring Frequency for Additional Parameters (Group 4)¹

Month	May	June	July	August	September
HADD Fish-Bearing Water Crossings ²		F		S	

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Notes:

F – Indicates Freshet water sampling event

S – Indicates Summer water sampling event

¹Water samples for Group 3 (oil & grease) will be collected where visible sheen is observed.

²HADD fish-bearing water crossings are identified in Table D-3.


During each water sampling event, water samples will be collected at a location approximately 100 metres downstream and 50 metres upstream of each monitored water crossing, as access allows. Field monitoring (*in-situ*) parameters will be measured at the same locations. Deviations from these established distances due to safety and/or accessibility concerns will be documented on the *TRMP – Sampling Event Monitoring Form*.

Water sampling events will start at the monitoring location furthest downstream of the monitored water crossing and progress in an upstream direction to prevent monitoring results from being affected by sediment re-suspended during sampling activities (e.g. stream bed disturbance).

It should be noted that additional monitoring may be required if the TSS water quality action levels, presented in Section 6 below, are exceeded. Additional sampling requirements and responses to documented TSS exceedances under the TRMP are outlined in the action-response framework presented in Section 6.

6. TSS Water Quality Criteria and Response-Action Framework

The Tote Road Monitoring Program will utilize a response-action framework to identify, mitigate and monitor for Project related changes in TSS concentrations, if present. The response framework is outlined in the Figure D-2.

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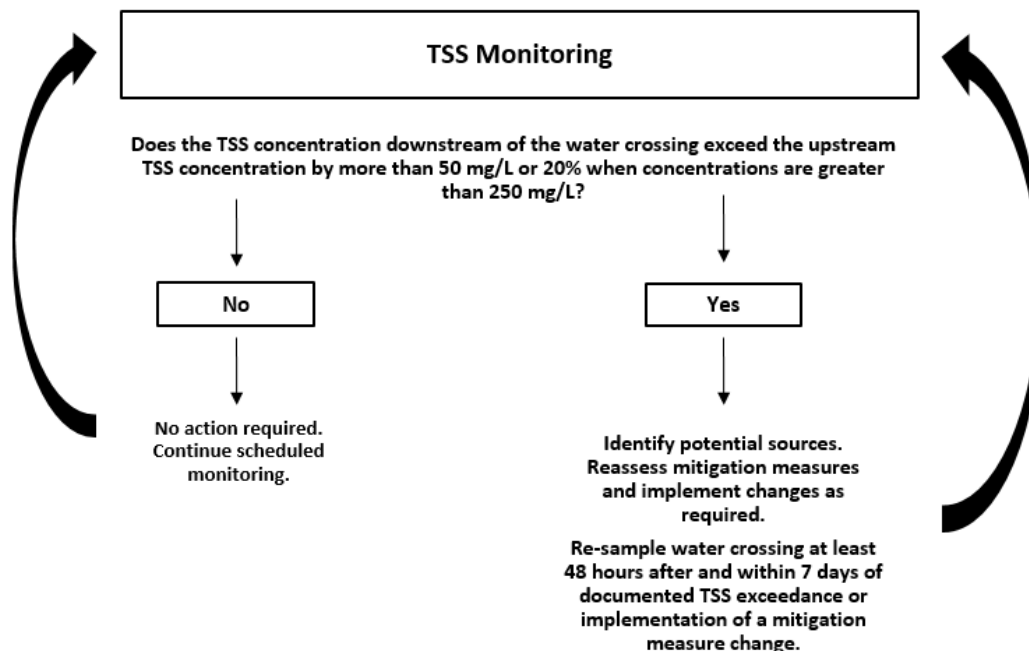


Figure D-2 – TSS Response-Action Framework


To evaluate the potential for a Project related change to concentrations of TSS within the Tote Road LSA, water samples will be collected at designated locations approximately 100 m downstream and 50 m upstream of the crossing, as access allows, at the frequency outlined in Section 3.3.1.4. Following receipt of analytical results, TSS concentrations at the upstream and downstream location will be compared. When upstream concentrations are less than 250 mg/L, a potential Project related change is defined as a greater than 50 mg/L increase in the downstream concentration. Where concentrations are greater than 250 mg/L in the upstream sample, a potential Project related change is defined as a greater than 20% increase in the downstream sample.

If the results of a sampling event identify a potential Project related change, Baffinland will implement new mitigation measures and/or assess the effectiveness of existing mitigation measures. During the assessment, the water crossing will be evaluated to determine the potential sources of the observed sedimentation event(s) and TSS concentration increases, including natural phenomenon. The water crossing will then be re-sampled at least two (2) days, but not later than seven (7) days, following receipt of sampling results to confirm that mitigation and/or corrective actions have reduced TSS concentrations below the appropriate action level.

7. Data Management

All data collected during monitoring activities will be documented using the *TRMP – Sampling Event Monitoring Form*. During each sampling event, a *TRMP – Sampling Event Monitoring Form* will be completed. All documentation, including photos, will be saved on the onsite Environmental server.

8. Data Reporting Requirements and Interpretation

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Data collected during the TRMP will be presented in the Annual Report prescribed by the Project's Commercial Lease with the QIA and the Type 'A' Water Licence, issued by the NWB. In the Annual Report, Baffinland will present the data, compare the data against the applicable water quality criteria and outline Baffinland's interpretation of the data and plans for any additional monitoring in the upcoming field season.

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