ATTACHMENT 25

Hazardous Materials and Hazardous Waste Management Plan

(54 Pages)

Baffinland Iron Mines Corporation

DRAFT HAZARDOUS MATERIALS AND HAZARDOUS WASTE MANAGEMENT PLAN

BAF-PH1-930-P16-0011

< PHASE 2 PROPOSAL REVISIONS - FOR REVIEW PURPOSES ONLY >

Rev A

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All staff members are responsible to ensure the latest version is used; these are available at: http://www.baffinland.com/document-portal-new/?cat=9&archive=1.

TRACK CHANGES TABLE

A review and update of the Hazardous Materials and Hazardous Waste Management Plan has been undertaken, the following revisions have been completed.

Index of Major Changes/Modifications in draft revision for the Phase 2 Proposal:

Item No.	Description of Change	Relevant Section
1	Reorganized the plan to be consistent with the five elements of ISO 14001:2015	Entire document
2	Updated to reflect the Phase 2 Proposal	Entire document

CONCORDANCE TO PREVIOUS DRAFT PLAN

Previous Section		New Section		Comments
1	Introduction		No Change	
1.1	Purpose and Scope		No Change	
1.2	Definitions	1.5	Definitions	
1.3	Hazardous Materials Regulatory Requirements	1.4	Regulatory Requirements	
1.4	Relationship to Other Management Plans	1.2	Relationship to Other Management Plans	
2	Baffinland Policies	1.3	Corporate Policies	Actual corporate policies moved to an appendix.
2.1	HSE Policy		Appendix A	
2.2	SD Policy		Appendix A	
		2	Planning	New “Planning” Section added to be consistent with ISO 14001:2015; addition of IQ and adaptive management sections as requested by the QIA.
		2.1	Objectives and Targets	
		2.2	Consideration of Inuit Qaujimajatuqangit	
		2.3	Project Design Considerations	
		2.4	Principles of Adaptive Management	
3	Project Hazardous Materials	3	Implementation	
3.1	AN and Explosive Materials	3.1	Hazardous Materials and Waste Management Facilities	Section restructured to include content from former Section 4.1
		3.1.1	AN and Explosive Materials	
3.2	Sewage Sludge	3.1.2	Sewage Sludge	
3.3	Fuels and Lubricants	3.1.3	Fuels and Lubricants	
3.4	Hydrocarbon Contaminated Soils	3.1.4	Hydrocarbon Contaminated Soils	
4	Hazardous Materials and Waste Lifecycle Approach	3.2	Hazardous Materials and Waste Lifecycle Approach	
4.1	Types of Hazardous Materials/Waste	3.5.1	Types of Hazardous Materials/Waste	Text moved into a table in Section 3.1
4.2	Approval	3.2.1	Approval	
4.3	Delivery	3.2.2	Delivery	
4.4	Hazardous Materials Identification and Handling	3.2.3	Hazardous Materials Identification and Handling	
4.5	Hazardous Waste Generation and Handling	3.2.4	Hazardous Waste Generation and Handling	

Previous Section		New Section		Comments
4.6	Temporary Storage of Hazardous Waste	3.2.5	Temporary Storage of Hazardous Waste	
4.7	Hazardous Waste Transportation Off-Site	3.2.6	Hazardous Waste Transportation Off-Site	
4.8	Relevant Operational Environmental Standards	3.2.7	Relevant Operational Environmental Standards	
5	Roles and Responsibilities	4	Roles and Responsibilities	
5.1	Environmental Responsibilities			Section heading not needed; All roles in a single table
5.2	Training and Awareness	4.1	Training and Awareness	
5.3	Communication			These sections were deleted as they don't seem necessary and are inconsistent with other plans.
5.4	External Communications			
6	Monitoring and Reporting Requirements	5	Monitoring and Reporting Requirements	
6.1	Hazardous Materials and Hazardous Wastes Monitoring	5.1	Hazardous Materials and Hazardous Wastes Monitoring	
6.2	Operations Monitoring	5.2	Operations Monitoring	
6.3	Data Management	5.3	Data Management	
		6	Review of Plan Effectiveness	Triggers for conducting review and changes of plan
7	Adaptive Strategies		Removed	
8	QA/QC		Removed	
9	References	7	References	
Appendix A - Tables of Concordance with Applicable Permits and Licences		Appendix A - Tables of Concordance with Applicable Permits and Licences		
		Appendix B - Corporate Policies		Taken from former Section 2
		Appendix C – Adaptive Management		
Appendix B - Site Layouts (Milne Port and Mine Site)		Appendix D - Site Layouts (Milne Port and Mine Site)		
Emergency Response Assistance Plan Appendix C - Dyno Nobel				Removed

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1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of this Plan is to identify Baffinland Iron Mines Corporation's (Baffinland's) framework for effective hazardous materials and hazardous waste management on the Mary River Project by providing instruction for the prevention, detection, containment, response, and mitigation of accidents that could result from handling hazardous materials. It also identifies the roles and responsibilities of its employees and contractors and as well as procedures for handling, storing and disposing of hazardous materials and hazardous waste generated at Project sites to ensure that it is conducted in a safe, efficient and environmentally compliant manner that minimizes the potential for adverse impacts to the environment.

A hazardous material is one that, as a result of its physical, chemical, or other properties, poses a hazard to human health or the environment when it is improperly handled, used, stored, disposed of, or otherwise managed.

The plan is based on the following best practice management practices established for the management of hazardous materials and hazardous waste generated at Project sites:

- Identify and prepare hazardous materials and hazardous waste inventories
- Characterize potential environmental hazards associated with hazardous materials
- Assign oversight and responsibility accountabilities for the management of hazardous materials
- Identify methods for the transportation, storage, handling and use of hazardous materials
- Identify safe and effective long-term storage and disposal mechanisms
- Prepare, assess and review contingency and emergency response plans
- Facilitate and ascertain effective training programs for management, workers, and contractors whose responsibilities include handling hazardous materials
- Maintain and review records of hazardous material consumption and incidents in order to anticipate and avoid impacts on personal health and the environment

Hazardous materials used at the Mary River Project will be manufactured, delivered, stored, and handled in compliance with applicable federal and territorial regulations. Baffinland is committed to preventing, inadvertent release of hazardous materials and hazardous wastes to the environment and accidents resulting from non-conformances. Baffinland has developed and implemented programs for employee training, facility inspection, drills and exercises to evaluate these systems, and procedural review to address deficiencies, accountability, and allow for continual improvement.

This Hazardous Materials and Hazardous Waste Management Plan (Plan) has been updated to support the environmental review and permitting of the Phase 2 Proposal. This plan may need further review and updating for the Phase 2 Proposal to incorporate direction provided in an amended project certificate and Type A Water Licence, once NIRB's reconsideration of the project certificate and the NWB's water licence amendment process have concluded. Additionally, further and continual modifications and revisions to this Plan shall be completed based on changes to Project infrastructure, waste management procedures, and protocols.

1.2 RELATIONSHIP TO OTHER MANAGEMENT PLANS

Development of this Plan was based on the concepts and principles identified in Baffinland's EHS Management System Framework Standard (BAF-PH1-830-STD-0001) and Baffinland's Hazard Identification and Risk Assessment Standard (BAF-PH1-830-PRO-0001).

Other management plans relevant to hazardous materials and hazardous waste management are described in Table 1.1.

TABLE 1.1 RELATIONSHIP TO OTHER MANAGEMENT PLANS

Plan/Guideline	Document No.	Information Provided by Referenced Plan
Waste Management Plan	BAF-PH1-830-P16-0028	Describes the wastes generated, waste minimization strategies and disposal methods. Includes an overview of the management and disposal of hazardous wastes provided in more detail within this plan.
Environmental Protection Plan (EPP)	BAF-PH1-830-P16-0008	Provides relevant environmental protection measures
Air Quality and Noise Abatement Management Plan	BAF-PH1-830-P16-0002	Describes the measures to abate air and noise emissions, and monitoring programs to verify mitigation performance
Fresh Water Supply, Sewage and Wastewater Management Plan	BAF-PH1-830-P16-0010	Management of sewage effluent and sludge and other effluents
Surface Water and Aquatic Ecosystems Management Plan	BAF-PH1-830-P16-0026	Identifies the management strategies and general mitigation measures related to controlling sedimentation and erosion effects on aquatic ecosystems
Interim Closure and Reclamation Plan	BAF-PH1-830-P16-0012	Closure measures including the waste disposal during active closure
Roads Management Plan	BAF-PH1-830-P16-0023	Mitigation measures related to road operation, including safety of land users, wildlife protection, air quality, erosion and sedimentation
Spill Contingency Plan	BAF-PH1-830-P16-0036	Response measures associated with spills, including releases of wastes
Emergency Response Plan	BAF-PH1-840-P16-0002	Process for responding to emergencies

Explosives are also hazardous materials. Explosives storage and use is governed by specific legislation (Section 1.4) and explosives require unique handling measures by specialized personnel. Management plans and procedures specific to explosives and blasting operations are identified in Table 1.2. An overview of explosives storage facilities is nonetheless also included in this Plan.

TABLE 1.2 EXPLOSIVES AND BLASTING RELATED GUIDANCE

Plan/Guideline	Document No.	Information Provided by Referenced Plan
Explosives Management Plan	BAF-PH1-830-P16-0009	Describes safe handling of explosives
Quarry Blasting Operations Management Plan	Baffinland, 2013	Describes the safe use of explosives at quarry operations
Emergency Response Assistance Plan (Explosives)	Dyno Nobel Baffin Island Inc. (DNBI), 2015 (Appendix E)	Emergency response and evacuation procedures related to incidents at the emulsion plant and explosives truck (i.e., explosion, lightning, firefighting, environmental releases)
Operations Blasting Procedure	BAF-PH1-340-PRO-0003	

1.3 CORPORATE POLICIES

Baffinland has two corporate policies that apply to environmental management:

- **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, health and environmentally responsible workplace.

All employees and contractors must comply with the contents of both above mentioned policies, which are included in Appendix A.

This plan aligns with the ISO 14001:2015 environmental management system standards, as Baffinland is working towards certification.

1.4 REGULATORY REQUIREMENTS

This Plan is required by the following Project authorizations:

- Type A Water Licence No. 2AM-MRY1325 issued by the Nunavut Water Board (NWB, 2015)
- Type B Water Licence No. 2BE-MRY1421 (NWB, 2014)

Tables of concordance with the requirements of the water licences relevant to the management of hazardous materials including wastes are provided in Appendix B.

The following legislation place specific requirements on the Project with respect to the management of hazardous materials and hazardous wastes:

- *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;
- *Explosives Act* and Regulations
- Ammonium Nitrate Storage Facilities Regulations

- *Transportation of Dangerous Goods Act* and Regulations
- National Fire Code
- *Fisheries Act*

The Government of Nunavut (GN) has published several guidelines to assist waste generators in effectively developing waste management plans to appropriately manage hazardous materials and wastes:

- Contaminated site remediation (GN, 2009)
- General management of hazardous waste (GN, 2010a)
- Mercury-containing products and waste mercury (GN, 2010b)
- Waste antifreeze (GN, 2011a)
- Waste asbestos (GN, 2011b)
- Waste batteries (GN, 2011c)
- Waste solvents (GN, 2011d)
- Industrial waste discharges (GN, 2011e)
- Ozone-depleting substances (GN, 2011f)
- Used oil and waste fuel (GN, 2012a)
- Waste lead and lead paint (GN, 2014a)
- Biomedical and pharmaceutical waste (GN, 2014b)

The Canadian Council of Ministers of the Environment developed an environmental code of practice for fuel storage (CCME, 2003).

These guidelines were used to develop this Plan.

Additionally, there are several standards for explosives, most notably the latest update to the Explosives - Quantity Distances tables (Bureau de Normalisation du Québec, 2015) that dictate the setbacks of explosives areas and potential explosion sites from exposed sites (i.e., buildings in which people live, work or assemble; a public road, railway or other transportation infrastructure; electrical facility or power line; or any place in which a substance that increases the likelihood of a fire or explosion is likely to be stored such as fuel or explosives).

1.5 DEFINITIONS

Terms utilized throughout the management plan are defined as follows:

Project:	The necessary tasks and work executed during the lifespan of the Project at the Project Site, including the construction, operation, closure and reclamation phases, of the Project.
Site:	The areas occupied by the Project facilities (permanent or temporary) during the construction, operation, closure and reclamation phases of the Project.
Contractor:	A person or business which provides goods, material, equipment, personnel, and/or services to Baffinland Iron Mines Corporation under terms specified in a contract.
Waste:	The residual waste material (hazardous, non-hazardous or Putrescible) generated during the construction, operation, closure and reclamation phases of the Project.

Hazardous Materials:	Hazardous materials possess properties such as flammability, corrosiveness, or inherent toxicity. These wastes and materials can pose a variety of risks, from skin damage on contact to the contamination of ground water, surface water, and soil as a result of leaching into the environment.
Hazardous Waste:	The wastes generated during the lifespan of the Project that present a threat to the human health or the environment because they exhibit one or more of the following characteristics: corrosive, reactive, explosive, toxic, inflammable, or biologically infectious.
Non-Hazardous Waste:	The wastes generated during the lifespan of the Project that do not present a threat to human health or the environment.
Putrescible Wastes:	The wastes generated during the lifespan of the Project that degrade very rapidly, i.e., plants, food scraps or animal remains.
Incinerator Wastes:	Waste identified as suitable for incineration based on incineration technology used on-site, applicable regulations and project approvals. Includes: food waste, domestic waste, packaging waste, wood waste, absorbents, and some types of filters (e.g., air filters)

The TDGA classifies hazardous materials into the following nine primary classes:

- Class 1 - Explosives
- Class 1 - Gases
- Class 3 - Flammable liquids
- Class 4 - Flammable solids
- Class 5 - Oxidizing substances and organic products
- Class 6 - Poisonous (toxic) and infectious substances
- Class 8 - Corrosives
- Class 9 - Miscellaneous products or substances

2.0 PLANNING

2.1 OBJECTIVES AND TARGETS

The objectives and targets of this Hazardous Materials and Hazardous Waste Management Plan are identified in Table 2.1.

TABLE 2.1 OBJECTIVES AND TARGETS

Objective	Target
Achieve effective waste handling, storage, and disposal	Zero health and safety incidents; zero releases/spills
Comply with applicable licences, regulations and the contents of the Plan	Full compliance (no non-compliance)

The Water Licences list conditions that apply to waste disposal. These represent the minimum targets for the Hazardous Materials and Waste Management Plan to achieve regulatory compliance.

2.2 CONSIDERATION OF INUIT QAUJIMAJATUQANGIT

Baffinland recently developed a draft Inuit Qaujimajatuqangit (IQ) Management Framework to support increased collaboration with Inuit and the integration of IQ into the Company's operations, where reasonable to do so (Baffinland, 2019). Specifically, the IQ Management Framework identifies the procedures and provides guidance on the following:

- The processes through which IQ can be shared with Baffinland
- 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

Implementation of the IQ Management Framework is expected to include the establishment of an Inuit Committee to involve Inuit in the full life cycle of Project development, from planning to reporting. The Terms of Reference for the IAP and mandate to implement the IQ Management Framework is subject to ongoing discussion between the QIA and Baffinland. At present, Baffinland believes that the Inuit Committee's role on the Project may include providing advice on the integration of IQ into the Project in the following areas:

- Identification or refinement of mitigation measures in management plans
- Design of monitoring programs and the interpretation of monitoring results
- Development of Implementation of adaptive management strategies, as necessary
- Development of future modifications to the project and subsequent application materials

Table 2.2 identifies the opportunities that Baffinland has explored to incorporate IQ into this Plan.

TABLE 2.2 INCORPORATION OF IQ INTO THIS MANAGEMENT PLAN

Element	Description
Environmental sensitivities and receptors	Relevant environmental sensitivities and receptors can be considered regarding the location of hazardous materials and hazardous waste storage facilities.
Adaptive management	To be discussed with Inuit Committee
Validation of IQ Integration	To be driven by IQ Management Framework
Management review	To be driven by IQ Management Framework

An important aspect of integrating IQ is validating such integration with Inuit. For this reason, only potential opportunities for IQ integration have been identified. A more fulsome effort to incorporate IQ into this draft plan will be undertaken in the future, consistent with Baffinland's IQ Management Framework and the TOR for the Inuit Committee.

2.3 PRINCIPLES OF ADAPTIVE MANAGEMENT

2.3.1 DEFINING THE ADAPTIVE MANAGEMENT PROCESS

Adaptive management is a planned and systematic process for continuously improving environmental management practices by learning about their outcomes (Canadian Environmental Assessment Agency, 2016). Adaptive management provides flexibility to identify and implement new mitigation measures or to modify existing ones during the life of a project.

Baffinland has developed an Adaptive Management Plan (AMP) that provides the framework by which adaptive management is to be incorporated into Project operations (Baffinland, 2019). The adaptive management process is iterative and starts with a planning phase; followed by implementation of monitoring; ongoing evaluation of the effectiveness of the plans based on monitoring results; and adjustment of the management strategies and responses as needed. The process is described further in Appendix C.

2.3.2 ADAPTIVE MANAGEMENT CHECKLIST FOR ENVIRONMENTAL MANAGEMENT

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

TABLE 2.3 ADAPTIVE MANAGEMENT IN THE HAZARDOUS MATERIALS AND WASTE MANAGEMENT PLAN

Adaptive Management Phases	Components	Proposed Adaptive Management Mechanisms	Status of Management Plan
Plan	Objectives	Are objectives clear and key desired outcomes defined?	Section 2.1 - identifies plan objectives.
	Indicators	Are performance indicators adequately identified?	Section 2.1 - identifies targets related to plan objectives. Thresholds are binary (compliant or non-compliant).
	Identification of Thresholds	Are thresholds for specific responses identified (e.g., early warning triggers, action levels, quantitative metrics or qualitative descriptions)?	
	IQ Integration / Influence	Are mechanisms for IQ integration/influence identified?	Potential integration of IQ will be discussed with the Inuit Committee.
Implement and Monitor	Management Strategies and Responses	Are management strategies and response options clearly identified?	Section 3 describes the management strategies and responses.
	Monitoring	Does the monitoring program provide the information needed to determine the effectiveness of management strategies and responses?	Section 5 presents monitoring activities associated with waste management and disposal.
Evaluate and Learn	Review Data and Feedback	Is the process for reviewing and evaluating management effectiveness (based on monitoring data and feedback) articulated?	Section 6 outlines the process of reviewing the level of compliance and determining if additional mitigation needs to be incorporated into a plan update.
	Additional Mitigation	Are mechanisms for determining the need for additional mitigation described?	
	Input of IQ Holders	Are opportunities identified for IQ holders to review results and provide input into adaptive management responses / mitigations?	To be discussed with the Inuit Committee.
Adjust	Unanticipated Effects or Issues	Is it apparent how unanticipated effects or issues will be actioned and resolved?	Section 6 outlines the annual review process that considers instances of both non-compliance and unanticipated effects.
	Reporting	Are reporting mechanisms for new / revised strategies and response actions established?	Section 6 describes the reporting mechanisms for revised strategies and response actions.
	Scheduled Updates	Is the frequency of scheduled updates to the management plan identified?	Section 6 (Review of Plan Effectiveness) describes the basis for conducting plan reviews.

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 (Appendix C).

3.0 IMPLEMENTATION

This section of the plan describes the measures to be undertaken regarding the management of the various hazardous materials and wastes that are present at the Project, to protect the environment and minimize health and safety risks.

3.1 HAZARDOUS MATERIALS AND WASTE MANAGEMENT FACILITIES

Project sites are equipped with the hazardous materials and waste management facilities summarized in Table 3.1. Storage details are included in the following sub-sections, while details on disposal are provided in Section 3.2. Key hazardous materials storage and waste management facilities are shown on site layouts in Appendix D.

TABLE 3.1 HAZARDOUS MATERIALS AND WASTE MANAGEMENT FACILITIES

Facility	Hazardous Material and Waste Type	Location
Emulsion Plant	Emulsion, Ammonia Nitrate	Mine Site (see Table 3.2)
Magazines	Packaged explosives, boosters, detonators	KM 7, 13, 52.4, 59.3, 63 Laydowns (see Table 3.2)
Seacan	Ammonia Nitrate	KM 97 Laydown, Milne Port, Mine Site (see Table 3.2)
Landfarm	Hydrocarbon Contaminated Soils	Mine Site, Milne Port (see Section 3.1.5)
Tank Farm	Diesel and aviation fuel	Mine Site, Milne Port (see Table 3.4)
Hazardous Materials Berm	Liquid and solid chemical wastes; waste fuel, lubricants and antifreeze; laboratory chemical wastes	Mine Site, Milne Port (see Table 3.8)
Various Site Buildings (maintenance shops, environmental office, medical clinic, waste management building)	Hydrocarbon Products, Liquid Chemicals, Solid Chemicals, Electronics and electronic waste, Biomedical Waste, Compressed Gas Cylinders, Ozone Depleting Substances	Mine Site, Milne Port (see Table 3.8)

Several items, such as compressed gas cylinders, used on site are no longer considered hazardous once the product is used up and the container has been properly cleaned as described in Table 3.8.

3.1.1 AMMONIUM NITRATE AND EXPLOSIVE MATERIALS

Ammonium nitrate (AN) is manufactured and used primarily as a fertilizer for agricultural purposes in many parts of the world. It is also used in the manufacture of commercial blasting explosives and is an important raw material in the manufacture of other products such as nitro-glycerine, water gels/slurries, and other types of blasting emulsions.

AN is a stable, inorganic, solid compound. It is completely soluble in water and must be kept dry to remain effective for its intended purpose. AN when in solution can be highly toxic to fish and can enhance the potential for eutrophication in the aquatic receiving environment (Environment Canada, 2015).

While AN is classified as a hazardous product, its storage and handling at Project sites do not represent significant risk when proper precautions are taken. At Project sites, qualified explosives contractors manage AN and other explosives-related materials. AN storage containers (1,000 kg tote bags) are stored in a safe area away from water bodies and from the explosives storage magazines. AN bags are handled individually when required for the preparation of explosives. AN spills will be swept-up and placed in suitable containers, and recovered material will be disposed of through consumption in subsequent blast holes or worked into manufactured product. Empty AN bags non-hazardous inert waste, and are burned in Project site incinerators. Site personnel exposed to AN area are required to wear appropriate personal protective equipment (PPE).

In Canada, the production, storage, and use of AN and explosive materials are subject to strict precautionary measures under the *Explosives Act* and Regulations, and the Ammonium Nitrate Storage Facilities Regulations. Explosives are subject to the *Transportation of Dangerous Goods Act* and Regulations during transportation via all modes. The hazard classes of explosives and their potential impacts are shown in Table 3.2.

TABLE 3.2 EXPLOSIVES - HAZARD CLASSES AND POTENTIAL IMPACTS

Material	Class	Potential Impact
Ammonium nitrate	5.1	Water contamination
High explosive detonators	1	Negligible with proper handling
Blasting caps	1	Negligible with proper handling

Table 3.3 outlines the maximum cumulative quantities of AN and explosives Baffinland intends to store at the Mary River Project, including the quantities needed to support construction of the Phase 2 Proposal.

3.1.1.1 AMMONIUM NITRATE STORAGE AND HANDLING

AN is stored on -site in containers in two locations; the KM 97 laydown and smaller quantities at the Mine Site Emulsion Plant operated by DNBI. The AN prill is stored in 1,000 kg tote bags, 20 of which are stored double-stacked in each of the 20’ containers. AN (in any amount) shall not be stored outside at any time and shall only be withdrawn from the containers when required by plant production. AN is loaded directly into the AN Handling Module of the plant to minimize any exposure of the product to the environment. An Explosives Management Plan provides details regarding the onsite storage locations and handling procedures of AN, including measures to minimize and dispose of spilled AN (DNBI, 2013).

TABLE 3.3 MAXIMUM QUANTITIES OF AMMONIUM NITRATE AND EXPLOSIVES AT PROJECT SITES

Storage Location	Material	Purpose	Storage Container	Maximum Quantity(kg)
Milne Port	AN	Temporary storage between unloading and transport to km97 storage	Seacans	15,000,000
Km 7 (existing/proposed)	Prepackaged explosives, boosters, detonators	Store explosives and hardware	Magazines/Bulk Truck	6,000/10,000
Explosives Area No. 1 Km 13 (proposed)			Magazines	200,000
Explosives Area No. 2 Km 52.4 (proposed)			Magazines	200,000
Explosives Area No. 3 Km 59.3 (proposed)			Magazines	200,000
Explosives Area No. 4 Km 63 (existing)			Magazines	300,000
Explosives Area No. 5 Km 78.2 (proposed)			Magazines	200,000
Km 97 (existing)	AN	Storage for emulsion plant	Seacans	15,000,000
Mine site (existing)	Prepackaged Explosives	Open pit mining	Magazines	132,000
	Emulsion	Open pit mining	ISO tank in plant	35,000
	Detonators	Open pit mining	Magazines	110,000 units
	AN	Emulsion manufacture	Totes on plant conveyor	8,000
			Seacans	200,000
Explosives trucks (2)	Emulsion	Rail construction	Explosives truck	10,000
Explosives trucks (2)	Emulsion	Open pit mining		10,000
	AN			4,000

3.1.1.2 EMULSION STORAGE AND HANDLING

DNBI operates an Emulsion plant at the Mine Site in accordance with an Explosives Regulatory Division Factory Licence issued by Natural Resources Canada (NRCan). The plant produces a 100% emulsion product from AN prill and fuel oil. Emulsion explosives are hydrophobic and therefore do not have the same water solubility as AN prill or another commonly used explosives product, Ammonium Nitrate Fuel Oil (ANFO). The emulsion product was selected in part because waste due to spills and ammonia runoff is minimized.

Emulsion is stored in a single, 36,000 kg capacity tank within the emulsion loading garage at the DNBI Emulsion Plant located at the Mine Site. Smaller quantities may be stored in the two bulk emulsion trucks (10,000 kg capacity each) which are parked in the heated garage when not in use, to prevent freezing. An additional two explosives trucks will support construction.

Smaller quantities of AN emulsion pre-packaged explosives will be used to begin development of the quarry sites. Pre-packaged AN emulsions also pose minimal risk to the environment given the hydrophobic nature of the emulsion explosives.

Phase 2 requires the expansion of ammonium nitrate storage and explosives magazine storage facilities to support rail construction. Temporary storage of magazines will be required at three locations along the northern transportation corridor. This includes proposed magazine storage facilities at km 13, km 52.4, km 59.3 and km 78.2. Existing magazine storage facilities are located at km 7 and km 63, and AN storage at km 97.

3.1.2 SEWAGE SLUDGE

Sewage sludge generated at Project sites is treated and disposed of in a safe and effective manner. Sewage sludge may contain pathogenic bacteria Salmonella and Escherichia coli (E. coli), and thus proper handling of sewage sludge is imperative. .

Personnel required to work with sewage sludge must receive training on the following standard hygiene practices:

- Frequent and routine hand washing
- The proper use of appropriate PPE (goggles, face shields, respirators, liquid-repellent coveralls and gloves)
- The removal of contaminated PPE and the use of available on-site showers, lockers, and laundry services
- Proper storage, cleaning, or disposal of contaminated PPE
- Instructions that work clothes and boots should not be worn home or outside the immediate work environment
- Prohibition of eating, drinking, or smoking while working in or around treated sewage sludge
- Procedures for controlling exposures to chemical agents that may be in sewage sludge

Hand-washing stations with clean water and sanitizing soap are readily available where contact with sewage sludge occurs.

3.1.3 FUELS AND LUBRICANTS

Hydrocarbon products and chemicals such as combustible diesel fuels, antifreeze, compressed gases, lubricants, and cutting oils are widely used at Project sites for power generation, heating, and vehicle operation. The transportation, storage, and handling of diesel products are regulated by both federal and territorial legislation. Regular inspections of storage and distribution facilities are completed at Project sites to verify mechanical soundness and to prevent leaks and the uncontained release of diesel fuel.

Material categories, site handling and storage requirements recommended by manufacturers in Safety Data Sheets (SDS) are summarized in Tables 3.4 and 3.5.

TABLE 3.4 FUEL PRODUCTS - HAZARD CLASSES, POTENTIAL IMPACTS AND STORAGE LOCATIONS

Material	Class	Total Amount - Container	Potential Impact
Diesel	3	Drums, Tank Farms	Water and soil contamination
Aviation fuel	3		Water and soil contamination
Motor oil	NR	Drums	Soil contamination
Hydraulic fluid	NR	Drums	Soil contamination
Varsol	3	TBD – Barrels and/or pails	Soil contamination
Vehicle grease	NR	Pails	Negligible risk with proper handling
Ethylene glycol	NR	Drums	Negligible risk with proper handling

NOTE:

1. NR: Not Regulated.

TABLE 3.5 FUEL PRODUCTS - SAFE HANDLING PROCEDURES

Material	Handling Procedure
Diesel	Do not get in eyes, on skin, or on clothing. Avoid breathing vapours, mist, fume, or dust. Do not swallow. May be aspirated into lungs. Wear protective equipment and/or garments if exposure conditions warrant. Wash thoroughly after handling. Launder contaminated clothing before reuse. Use with adequate ventilation. Keep away from heat, sparks, and flames. Store in a well-ventilated area. Store in a closed container. Bond and ground during transfer.
Aviation fuel	See diesel procedures above.
Motor oil	Wear protective clothing and impervious gloves when working with used oils.
Hydraulic fluid	Keep container closed until ready for use.
Varsol	Avoid eye contact. Use with adequate ventilation. Wash thoroughly after handling. Empty container retains residue. Follow label instructions. Avoid repeated skin contact. Store in cool, ventilated area, away from ignition sources and incompatibles. Keep container tightly closed.
Vehicle grease	Minimize breathing vapor, mist, or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before re-use. Remove contaminated shoes and thoroughly clean before re-use; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water. To prevent fire or explosion risk from static accumulation and discharge, effectively ground product transfer system in accordance with the National Fire Code. Keep containers closed when not in use. Do not store near heat, sparks, flame, or strong oxidants.
Ethylene glycol (antifreeze)	Ensure adequate ventilation. Wear protective gloves and chemical safety goggles. Keep in tightly closed container, stored in a cool, dry, ventilated area. Separate from acids and oxidizing materials. Empty containers of this product retain product residues and may be hazardous. Used antifreeze will be placed in its original containers for offsite disposal.

Only contract suppliers or trained site Personnel are permitted to complete fueling activities of storage tanks located at Project Bulk Fuel Storage Facilities (Milne Port and Mine Site Tank Farms). The following activities are required for bulk fuel transfer:

Before fuel transfer, verification that:

- All fuel transfer hoses have been connected properly and couplings are tight
- Transfer hoses are not obviously damaged
- Fuel transfer personnel are familiar with procedures
- Personnel are located at both the fuel delivery truck and fuel transfer tank(s) and can manually:
  - Shut-off fuel flow
  - If a high liquid level shut-off device is installed at the delivery tank, verify that the shut-off is operating correctly each time it is used
  - Fuel transfer will then proceed per the established procedures of the contract supplier
  - Accidents or spills must be reported immediately to the Environment Department

Upon closure of the mine and facilities, some storage capacity will be left in place at site for diesel fuel for the use of personnel involved in close-out and reclamation activities. Small amounts of other petroleum products will also continue to be available. For additional information, refer to Baffinland's Interim Mine Closure and Reclamation Plan.

3.1.4 USED OIL AND WASTE FUEL

Used oil used for fuel burner feedstock, will comply with Government of Nunavut's *Environmental Guideline for Used Oil and Waste Fuel (GN, 2012a)* and impurity levels identified in Table 3.6.

TABLE 3.6 MAXIMUM LEVELS OF IMPURITIES IN USED OIL/FUEL BURNER FEEDSTOCK

Impurity	Maximum Concentration (ppm)	
	Used Oil	Waste Oil
Cadmium	2	2
Chromium	10	10
Lead	100	100
Total Organic Halogens (as chlorine)	1000	1500
Polychlorinated Biphenyls	2	2
Ash Content	-	0.6% by weight

NOTE:

1. Values taken from Table 4, Environmental Guideline for Used Oil and Waste Fuel (GN, 2012a).

3.1.5 HYDROCARBON CONTAMINATED SOILS

Soils contaminated by hydrocarbons from spills and Project decommissioning activities are salvaged and deposited at the Landfarm Facility located at Milne Port for bioremediation.

The Milne Port Landfarm Facility consists of two geomembrane lined containment cells. The larger (3,383 m^3) west cell (landfarm) was constructed for the containment and biotreatment of hydrocarbon contaminated soils. Treated soils that meet prescribed criteria will be used as landfill cover material or for other purposes upon receipt of approval from appropriate regulatory agencies.

Contaminated soils can be excavated when the ground is unfrozen, and following excavation the soils are placed and spread within the landfarm for remediation through natural microbiological and evaporative processes. Soil that has reached acceptable levels of hydrocarbon biodegradation and meets remediation criteria provided in the *Environmental Guideline for Contaminated Site Remediation* (Government of Nunavut, 2009) can then be removed and transferred to the landfill or other appropriate use. The Landfarm Facility is operated in accordance with Nunavut government guidelines and Baffinland's Landfarm Operation, Maintenance and Monitoring Manual (BAF-PH1-320-T07-0004). As part of Landfarm operations, soil is turned regularly to provide aeration and promote the remediation process. Periodic inspections and sampling will be conducted to assess the efficiency of the biodegradation process.

The smaller (929 m^3) east cell was constructed for the containment of hydrocarbon contaminated snow generated during the winter months and the treatment of the contaminated water during the summer months using mobile Oily Water Treatment Facilities (OWTF). During treatment, monitoring will be completed at several stages of the treatment process to ensure discharges to the environment comply with the water quality discharge criteria outlined in Baffinland's Type A Water Licence.

3.2 HAZARDOUS MATERIALS AND WASTE LIFECYCLE APPROACH

The intent of this Plan is to implement a sound hazardous materials minimization program that focuses on the principles of Lifecycle Management, with the goal of managing hazardous material from their procurement, to their delivery to Project site, throughout their use, and to their disposal. The Hazardous Materials and Hazardous Waste Management Approach is intended to be used in conjunction with Baffinland's Hazard Identification and Risk Assessment Standard (BAF-PH1-830-PRO-0001) to identify supply, transportation, storage, and handling, recycling, and waste disposal of hazardous materials. Baffinland is committed to ensuring proper lifecycle management of all hazardous materials used at Project sites.

3.2.1 APPROVAL

Controlled or non-controlled products with external Safety Data Sheets (SDSs) are reviewed and authorized prior to use at Project sites, in accordance with Baffinland's MSDS Approval and Management Procedure (BAF-PH1-810-PRO-0025). Requisitions completed for new materials require a product approval form which is required to be reviewed and approved by the Health and Safety, and Environment Departments. The product approval process involves consideration for more suitable alternative products, high potential for permit violation, and storage requirements.

3.2.2 DELIVERY

Hazardous materials are delivered to the Project via commercial carriers in accordance with the requirements of the *Canadian Transportation of Dangerous Goods Act* (TDGA). Carriers are licensed and inspected as required by the Department of Transportation. All required permits, licences, and certificates of compliance are the responsibility of the carrier. All shipments are properly identified and placarded. Shipping papers are required to be accessible and include information describing the substance, immediate health hazards, fire and explosion risks, immediate precautions, fire-fighting information, procedures for handling leaks or spills, first aid measures, and emergency response telephone numbers.

Transportation companies are required to develop a spill prevention, control, and countermeasures plan to address the materials they are transporting. In the event of a release during transport, the commercial transportation company is responsible for first response and clean-up.

3.2.3 HAZARDOUS MATERIALS IDENTIFICATION AND HANDLING

When hazardous materials arrive at Project sites, additional regulations apply. The federal Workplace Hazardous Materials Information System (WHMIS) requires proper labelling of products, the availability of product information in the form of SDSs. In addition, awareness training for site Personnel on how to identify and handle hazardous products is completed as necessary.

In compliance with Environment Canada requirements, bulk fuel storage tanks at Project sites are installed in secondary containment areas constructed to hold at least 110% of the volume of the largest tank or are certified double walled vessels.

Emergency response procedures developed for the release of chemical substances at Project sites are provided in Baffinland's Spill Contingency Plan. The SPC provides appropriate response procedures for accidental spills or releases of hazardous materials to minimize immediate risks to human health and the environment.

3.2.4 HAZARDOUS WASTE GENERATION AND HANDLING

Once consumed, residual hazardous materials become hazardous waste. Hazardous wastes include liquids or solids designated as hazardous wastes under federal or provincial regulations (e.g., hydrocarbon liquids, used batteries, various chemicals used during concrete operations, coating materials and a wide variety of other materials including any containers, containing residual amounts of hazardous materials). Unidentified chemicals and/or materials generated at Project sites are hazardous waste (unless otherwise identified) and are disposed of accordingly.

Hazardous waste generated at Project sites is handled by trained workers according to relevant standard operating procedures, job hazard assessments, and other documents (e.g., the EPP and environmental permits).

Quarterly inventories of hazardous wastes stored in Hazardous Waste Storage Berms (HWBs) are submitted to the QIA.

Hazardous waste is required to be clearly labelled, and at no time shall hazardous waste be combined with other solid or liquid non-hazardous waste. Spill kits are located inside the hazardous waste storage areas (refer to the Spill Contingency Plan). Should the spill of a hazardous waste occur, Baffinland or its assigned representative will oversee its clean-up, removal of contaminated material, temporary storage, transportation and disposal of the hazardous waste contaminated material to an approved off-site hazardous waste disposal or treatment facility.

Hazardous wastes identified in Section 3.1 are prevented from entering any water body. As required, Project hazardous waste storage areas are located at a minimum of thirty-one (31) metres from the ordinary High Water Mark of any water body.

Smoking within 10 meters of hazardous waste storage locations is prohibited.

Material categories, site handling and storage requirements, and PPE for hazardous waste are identified in Table 3.7. Final disposal methods are identified in Table 3.8.

TABLE 3.7 HAZARDOUS WASTE HANDLING REQUIREMENTS

Material	Handling Procedure
Liquid chemical waste (glycols, solvents, paint, brake fluid, hydraulic fluids, etc.)	Do not get in eyes, on skin, or on clothing. Avoid breathing vapours, mist, fume, or dust. Do not swallow. May be aspirated into lungs. Wear protective equipment and/or garments if exposure conditions warrant. Wash thoroughly after handling. Launder contaminated clothing before reuse. Use with adequate ventilation. Keep away from heat, sparks, and flames. Store in a well-ventilated area. Store in a closed container. Bond and ground during transfer.
Solid chemical waste (batteries, fluorescent lights, aerosol cans, etc.)	Avoid breathing vapours mist fumes and ensure they are stored in well-ventilated area. Store in an area away from direct sunlight and ensure containers are sealed at all times. Ensure no visible leaks or damage to containers holding the waste. Keep away from heat, sparks and flames. Use self-closing and flame resistant containers where possible.
Electronic waste (TVs, computer CRTs (screens) and computer hard drives	Where possible Environmental Protection Act (EPA) encourages reuse and recycling of end-of life electronic waste. Dismantling and providing reuse possibilities, enables intact natural resources to be conserved and air and water pollution caused by hazardous disposal avoided. Sanitize before disposal and return to manufacturer where possible.
Laboratory chemical waste	Avoid contact with eyes skin clothing. Do not breathe dust or other vapours. Wash thoroughly after handling. Maintain general industrial hygiene practices when using this product. Store between 10° and 25°C. Keep away from: acids/ acid fumes. Oxidizers - Protect from heat moisture and ensure container lids are tightly closed at all times.
Biomedical waste	Avoid eye contact. Use with adequate ventilation. Wash thoroughly after handling. Ensure waste is stored in areas away from general traffic and accessible only to authorized person. Follow label instructions. Avoid repeated skin contact. Store in cool, ventilated area. Keep container tightly closed. Waste cannot be stored for long periods and shall be transported in leak proof containers.
Ozone depleting substances (ODS) (i.e. refrigerants, etc.)	Required to be permanently labelled with the quantity and type of ozone depleting substance contained within that equipment. Compressor rooms housing stationary refrigeration and air conditioning systems should have refrigerant detectors and alarms installed to detect refrigerant leaks and emissions. Ensure trained licensed personal.
Compressed gas cylinders	Smoking prohibited when handling or transporting these cylinders. Store cylinders in the upright position and secure with an insulated chain or non-conductive belt. Ensure that protective caps are in place and that the area is well ventilated. Protect cylinders from contact with ground, ice, snow, water, salt, corrosion and high temperatures. Storage areas for compressed gas cylinders must not contain any unnecessary combustible materials or uncontrolled ignition sources. Be aware that environmental conditions, such as heat exposure, may cause the temperature of the cylinder to rise to excessive levels that could lead to a release of product even if the ambient temperature is relatively low.

3.2.5 TEMPORARY STORAGE OF HAZARDOUS WASTE

Hazardous wastes generated from temporary and permanent shelters along the Tote Road are temporarily stored in containers at the shelter until it is transported for temporary storage at designated on-site hazardous waste storage locations (e.g. HWBs).

3.2.5.1 HAZARDOUS WASTE CONTAINERS

The following general waste storage requirements apply to most hazardous waste generated by Project activities:

- Store in original container when possible or in containers manufactured to store hazardous waste
- Containers must be sound, sealable, and undamaged
- Store in 16 gauge (or lower) metal or plastic drums, or other appropriate container
- Label according to WHMIS and TDG guidelines
- Keep containers closed or sealed at all times unless in use
- Protect containers from damage and weather
- Store in secure area with controlled access
- Train personnel in appropriate handling and disposal practices as described in this plan, as well as WHMIS and TDGR requirements
- Store in a manner to prevent spills to environment (i.e., within secondary containment as described in Section 3.2.5.2)
- Never store with food or in food containers

3.2.5.2 HAZARDOUS WASTE STORAGE AREAS

Hazardous waste storage areas at Project sites must meet the following criteria:

- Storage areas for hazardous wastes are located at a minimum of thirty-one (31) metres from the ordinary high water mark of any water body
- Storage areas for hazardous waste are in lined and bermed facilities (HWBs) constructed to contain spills and prevent discharge to the surrounding environment
- Site drainage is managed such that spills and contaminated run-off are prevented from flowing off-Project areas and surrounding run-off onto Project areas is minimized
- Incompatible wastes are segregated by chemical compatibility to ensure the safety of Site Personnel and the environment
- Only Site Personnel trained in waste handling procedures are authorized to enter Project hazardous waste storage areas
- Regular inspections are completed and documented. Containers are placed so that each container can be inspected for signs of leaks or damage. Leaking or damaged containers will be removed and their content transferred to a sound container
- The type and quantity of waste in the storage is documented
- Storage sites have emergency response equipment appropriate for the hazardous waste stored at that location
- Storage sites are registered as required by regulations

To comply with the conditions in Baffinland's Type A Water Licence Baffinland will provide notification to the Inspector and the Board of any contaminated soils, water or waste that is generated at Project sites in the submission of their Annual Report.

Table 3.8 provides the management and final disposal methods by hazardous waste material.

TABLE 3.8 HAZARDOUS WASTE MANAGEMENT METHODS

Waste Material	Waste Type	Classification	General Management Method	Final Disposal
Absorbents - and other similar spill response material	Petroleum	Hazardous if used for a spill clean-up. Not TDG regulated.	Collect in white Quatrex bags. Store full bags in the hazardous waste storage areas until final disposal.	Offsite disposal
Activated Carbon	Petroleum	Hazardous. Not TDG regulated.	Collect in white Quatrex bags. Store in the hazardous waste storage areas until final disposal.	Offsite disposal
Aerosol Cans	HHW	Hazardous. TDG regulated as "Aerosol, Flammable, Class 2.1, UN 1950"	Disposal bins located at various locations inside the main facilities, and at the waste management building. Store full drums in the hazardous waste storage areas in open top drums.	Offsite disposal
Appliances	Inert/ Chemical	May be hazardous.	Appliances may contain ozone depleting substances (refrigerator) or electronic boards. Manage accordingly. Store in contained location until approval by environment office to dispose in landfill.	Landfill
Batteries, wet (lead - acid)	Chemical	Hazardous. TDG regulated as "Batteries, wet, filled with acid, class 8, UN 2794"	Collect in black Quatrex bags in workplace sorting areas. Store full bags in the hazardous waste storage areas until final disposal.	Offsite disposal
Batteries, rechargeable (NiCad, Mercury, Lithium, Silver-Oxide)	HHW	Hazardous. Small household-type batteries are generally not TDG regulated.	Disposal bins (same as for alkaline batteries) are located at various locations inside the main facilities. Segregate per type and transfer to different 20L pails. Transfer to 20L pail, then in open top drums. Store in the waste berm. Computer batteries should be brought to the Environment Office.	Offsite disposal
Batteries, dry (alkaline)	HHW	Hazardous. Not TDG regulated.	Disposal bins (same as for rechargeable batteries) are located at various locations inside the main facilities. Transfer to 20L pail, then in open top drums. Store in the hazardous waste storage areas.	Offsite disposal
Biomedical Waste - Sharps, human anatomical, blood, and body fluids	Biomedical	Biomedical hazard.	Contain and store in suitable biohazard container at the medical office until disposal.	Offsite disposal

Waste Material	Waste Type	Classification	General Management Method	Final Disposal
Calcium Chloride	Chemical	Hazardous. Not TDG regulated.	Collect and store in white Quatrex bags.	Offsite disposal or use as dust suppressant on roads (as authorized)
Chemicals - spent lab reagents	Chemical	Hazardous. Shipping TDG instructions should follow SDS recommendations.	Management method should follow SDS recommendations.	Offsite disposal
Cigarette butts	Chemical	Hazardous. Not TDG regulated.	Collect in cigarette butts receptacles outside each main entrance.	Offsite disposal/ Incineration
Compressed gas cylinders	Chemical	Hazardous. TDG regulation varies depending on gas.	Safely empty cylinders of all gases. Store away from sources of heat and ignition. Return containers to manufacturer for reuse following TDG procedures. When not shipped offsite, remove valves and purge cylinder with compressed air or inert gas. Dispose of as metal.	Offsite reuse /Landfill
Contaminated Soils	Petroleum	Hazardous. Not TDG regulated.	Store and decontaminate on site in landfarms.	Onsite treatment
Contaminated snow, ice	Petroleum	Hazardous. Not TDG regulated.	Store in contaminated snow dump adjacent to landfarm. Treatment in oil/water separator.	Onsite treatment
Contaminated water	Petroleum	Hazardous. Not TDG regulated.	Collect in trays, drums, or pumped via pipeline. Store in closed top drums or bladders in the waste berm until treatment in oil/water separator.	Onsite treatment
Diesel fuel	Petroleum	Hazardous. TDG regulated as “Diesel, Class 3, UN 1202, FP 39°C”.	Collect in trays, drums, or pumped via pipeline. Store in closed top drums in the hazardous waste storage areas until final disposal. Not a waste unless contaminated by a substance that makes it unusable as a fuel. Diesel not suitable as mobile fuel can be used for heating purposes.	Offsite disposal/ onsite recovery
Drums - empty	Petroleum	Hazardous. Not TDG regulated.	Empty containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. Empty drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner.	Offsite disposal
Drums - residuals	Petroleum	Hazardous; considered the same hazard as original product.	Drum residuals are to be collected in different containers for reuse (diesel, jet A, oil) or disposal (antifreeze or other product). Reuse diesel and oil for heating and other uses.	Onsite recovery/ Offsite disposal

Waste Material	Waste Type	Classification	General Management Method	Final Disposal
Electronic Equipment	HHW	Hazardous; not TDG regulated. May contain heavy metals.	Typical electronic wastes consist of used computers, cell phones, cameras, TVs and monitor screens, media players, switches, and testing equipment. Electronic wastes shall be brought to the Environment Office. They are stored in contained location until offsite shipment for recycling. Batteries shall be removed of equipment and managed accordingly.	Offsite recycling
Fluorescent Lamps - bulbs and tubes	HHW	Hazardous in large quantities (trace amount of mercury); not TDG regulated.	Bulbs disposal bins are located at various locations inside the main facilities. Repack in original or reused boxes. Store tubes in recycling container. Store in designated location until offsite shipment for recycling.	Offsite disposal
Filters - Lube oil	Petroleum	Hazardous; not TDG regulated.	Drain and crush filters. Collect in open top drums and store in the hazardous waste storage areas.	Offsite disposal
Gasoline	Petroleum	Hazardous; TDG regulated as "Gasoline, Class 3, UN 1203, FP -39°C".	Collect in trays, drums, or pumped via pipeline. Store in closed top drums in the hazardous waste storage areas until final disposal. Not a waste unless contaminated by a substance that makes it unusable as a fuel.	
Glycol	Chemical	Hazardous; not TDG regulated.	Collect in trays, drums, or pumped via pipeline. Store in closed top drums or 1000L tote tanks / cubes in the hazardous waste storage areas until final disposal.	Offsite disposal
Grease	Petroleum	Non-hazardous.	Store in open top drums in the hazardous waste storage areas until final disposal.	Offsite disposal
Human Waste	Domestic	Hazardous; not TDG regulated.	Store in open top drums in the hazardous waste storage areas until final disposal.	Offsite disposal
Hydraulic fluid	Petroleum	Hazardous; not TDG regulated.	Collect in trays, drums, or pumped via pipeline. Store in closed top drums in the hazardous waste storage areas until final disposal.	Offsite disposal
Incinerator Ash	Inert/ Chemical	Usually non-hazardous	Composition of incinerator ash will depend on the wastes that were incinerated. Disposal in open top drums. Suitable for disposal in the landfill.	Landfill

Waste Material	Waste Type	Classification	General Management Method	Final Disposal
Jet A Fuel	Petroleum	Hazardous; TDG regulated as "Aviation gas, UN 1863, FP 39°C".	Collect in trays, drums, or pumped via pipeline. Store in closed top drums in the hazardous waste storage areas until final disposal. Not a waste unless contaminated by a substance that makes it unusable as a fuel. Jet A not suitable as aviation fuel can be used for heating purposes.	Onsite recovery/ Offsite disposal
Kitchen Grease/Oil	Domestic	Non-hazardous	Collect in closed-top drums or 20L pails in a sea container outside the kitchen. Suitable for incineration or transport to PSC a week before backhaul for final disposal.	Incineration/Offsite disposal
Lube Oil	Petroleum	Hazardous; not TDG regulated.	Collect in trays, drums, or pumped via pipeline. Store in 1000L tote tanks / cubes in the hazardous waste storage areas until final disposal. Possible reuse as heating oil or other uses in approved furnaces.	Offsite disposal/ Onsite reuse
Metal	Inert	Non-hazardous, inert waste.	Collect and store in landfill bins.	Landfill
Methanol	Chemical	Hazardous; TDG regulated as "Methanol, Class 3, UN 1230, P.G. II"	Collect in UN certified container. Store in the hazardous waste storage areas.	Offsite disposal
Oily rags and similar debris	Petroleum	Not hazardous if used for cleaning; classified as Absorbent if used to clean-up spills.	Suitable for incineration. Collect in drums at workplace sorting areas. Bring to incinerator and disperse between waste loads.	Incineration
Ozone Depleting Substances (ODS, i.e. air conditioning and refrigerant gases)	Chemical	Hazardous	ODS must be removed by certified technician before disposal of unit. ODS must be stored as per instructions from certified technician.	Offsite disposal
Paint	Petroleum	May be hazardous if oil-based.	Collect in white Quatrex bags. Store in the hazardous waste storage areas until final disposal.	Offsite disposal
Plastics - oil/ hydrocarbon containers, contaminated berm liner	Petroleum	Hazardous; not TDG regulated.	Drain fluid in appropriate cube or drum. Collect in white Quatrex bags. Store in the hazardous waste storage areas until final disposal.	Offsite disposal
Unusual Waste	To be determined	To be determined	Bring to the Environment Office, if size permits. Proper management and disposal will be determined on a case-by-case basis.	To be determined

3.2.6 HAZARDOUS WASTE TRANSPORTATION OFF-SITE

Hazardous waste generated at Project sites is shipped off-site to approve hazardous waste disposal and recycling facilities. Hazardous waste will not be transported to community hamlets. Storage and shipping containers will have proper containment measures. Manifests will be prepared for materials shipped off-site and the receivers are required to maintain chain-of-custody records. Shipping will be undertaken only by those trained in the Transportation of Dangerous Goods (TDG). Hazardous waste storage and handling areas are routinely inspected for leaks, spills, and the implementation of appropriate containment measures.

Baffinland maintains records of waste backhauled from the Mary River Project and confirmation of proper disposal through the use of waste manifest tracking systems and registration with the Government of Nunavut, Department of Environment. These records will be made available upon request, to an Inspector or the Board.

3.2.7 RELEVANT OPERATIONAL ENVIRONMENTAL STANDARDS

Environmental Protection Plan (EPP) Operational Environmental Standards (OES) that are relevant to this Plan are identified in Table 3.9. As required, where there is a modification to a relevant OES, this Plan will be revised to reflect that change.

TABLE 3.9 RELEVANT OPERATIONAL ENVIRONMENTAL STANDARDS

Section	Title/Description
4.1	Equipment Operations
4.2	Fuel Storage and Handling
5.1	Solid Waste Management
5.2	Hazardous Waste Management
5.3	Wastewater Treatment
7.1	Geotechnical Drilling Operations
7.2	Exploration Drilling Operations
7.3	Drilling, Blasting and Crushing
7.4	Blasting in Water

4.0 ROLES AND RESPONSIBILITIES

The Baffinland Environmental Team is organized into two parts, on site as well as off site. The organisational structure for the Mary River Project in relation to waste management is shown in Table 4.1.

Position	Responsibilities and Accountabilities
Chief Operations Officer (COO)/General Manager	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's waste management facilities.
Port & Logistics Manager/Superintendent	Reports to the Chief Operations Officer. Responsible for providing support to the Site Services Manager in regard to the arrival of hazardous materials on sealifts and shipping of wastes (including hazardous wastes) offsite for disposal at licensed waste disposal facilities.
Site Services Manager	Reports to the COO / General Manager. Responsible for providing oversight for all Site Services operations, including coordinating the handling and storage of hazardous materials and the operation, maintenance and management of the Project's waste management facilities (containment berms, incinerators, landfill facilities, open burn facilities and landfarm facilities). The Site Services Manager is responsible for ensuring that Site Services personnel operating and managing the Project's waste management facilities receive the appropriate training.
Fixed Plant Superintendent	Reports to the Site Services Manager. Responsible for maintaining the Project's incinerators and waste management buildings.
Surface Works Superintendent	Reports to the Site Services Manager. Responsible for the operation and management of the Project's incinerators, containment berms, landfill facilities, open burn facilities and landfarm facilities.
Surface Works Supervisor	Reports to the Surface Works Superintendent. Responsible for the implementation of the operational and management practices for the Project's waste management facilities including the: • Hazardous Materials and Hazardous Waste Management Plan (BAF-PH1-830-P16-0011)
Project Employees and Contractors	All Project employees and contractors will be responsible for sorting and disposing of their waste (including hazardous waste) as outlined in this Plan.

Position	Responsibilities and Accountabilities
Environment Department	Reports to the Health, Safety and Environment Manager. The Environment Department will be responsible for: • Conducting biweekly environmental inspections of Project's waste management facilities to confirm conformance with the Project's established operational and management practices and reporting any identified deficiencies to the appropriate department for corrective action. • Sampling and monitoring incinerator bottom ash to confirm conformance with the applicable guidelines. • Conducting periodic waste audits to ensure waste streams are being properly segregated. • Providing environmental awareness training to Project employees and contractors, including waste management practices. • Reporting data and results of the Project's waste monitoring programs to the appropriate regulators and stakeholders. • The Environment Department will also support the Site Services Department in scheduling stack emissions test required for the Project's incinerators.
Health and Safety Department	Reports to the Health, Safety and Environment Manager. The Health & Safety Department will be responsible for conducting routine inspections of the Project's waste management facilities to confirm conformance with the Project's established operational and management practices, as it relates to the health and safety of Project personnel. Identified deficiencies will be reported to the appropriate department for corrective action.

4.1 TRAINING AND AWARENESS

Site personnel (including contractors) are required to obtain a general level of environmental awareness understanding of their obligations regarding compliance with Baffinland's regulatory requirements, commitments and best practices upon arrival at Project sites. Site personnel receive prescribed environmental training as part of Baffinland's Mary River Project Site Orientation.

Additional hazardous materials management and hazardous waste training is provided to individuals and groups of workers assuming a specific authority or responsibility for environmental or hazardous materials and hazardous waste management duties.

With respect to hazardous materials management, Baffinland has developed and implemented a training and awareness plan which identifies:

- The differing level of risks and potential consequences associated with different types of hazardous materials;
- The different responsibilities, abilities, and literacy of employees;
- The culture of the employees;
- Contractors involved and their relevant experience/expertise;
- Documentation of training and evaluation of training programs;
- The trainers, training methods, and settings; and
- Training frequency.

Review and modifications to training and awareness initiatives/programs are completed based on training needs and regulatory requirements.

5.0 MONITORING

5.1 HAZARDOUS MATERIALS AND HAZARDOUS WASTES MONITORING

Hazardous materials and hazardous wastes monitoring includes the visual inspection of hazardous materials and hazardous waste management facilities and the measurement and recording of these materials transported off-site. Baffinland reports the following information annually:

- The quantities of hazardous materials and hazardous wastes transported off-site for disposal
- The location and name of the disposal facility for each hazardous material and waste type
- The date hazardous wastes were transported off-site for disposal
- Quantities of landfilled non-hazardous inert solid wastes
- Quantities of hydrocarbon contaminated soils and water processed at treatment facilities

5.2 OPERATIONS MONITORING

Regular visual inspection of hazardous materials and hazardous wastes treatment facilities are conducted by the Environment Department to ensure that they are being operated in accordance with this Plan and that adequate environmental/health and safety controls are in place and are effective.

Regular hazardous materials audits are completed where waste is generated to ensure hazardous waste streams are properly segregated.

Compliance Monitoring Forms are used to document inspection findings and the required corrective actions. These reports are generated as internal operational management tools to promote continuous improvement in Project environmental performance and stewardship initiatives.

5.3 DATA MANAGEMENT

The Environmental Superintendent is responsible for data management and reporting related to hazardous materials and hazardous waste management. The data management system includes conducting routine inspections, monitoring, and delivery of findings to appropriate parties.

5.4 REGULATORY REPORTING

The quantities of hazardous wastes removed from the Project sites and transported to recycling and disposal facilities in the south are recorded with waste manifests. The manifests are included in the NWB and QIA Annual Report for Operations.

6.0 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. In addition, the Project is subject to external audits as noted 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. The results of this annual review will be reported in the annual report. Management plan updates that result from this process will also be filed with the annual report.

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
Post-construction	Mandatory management review
Every 3 years during operation	Mandatory management review

Plan updates will be recorded in the Document Revision Record located at the front of the Plan.

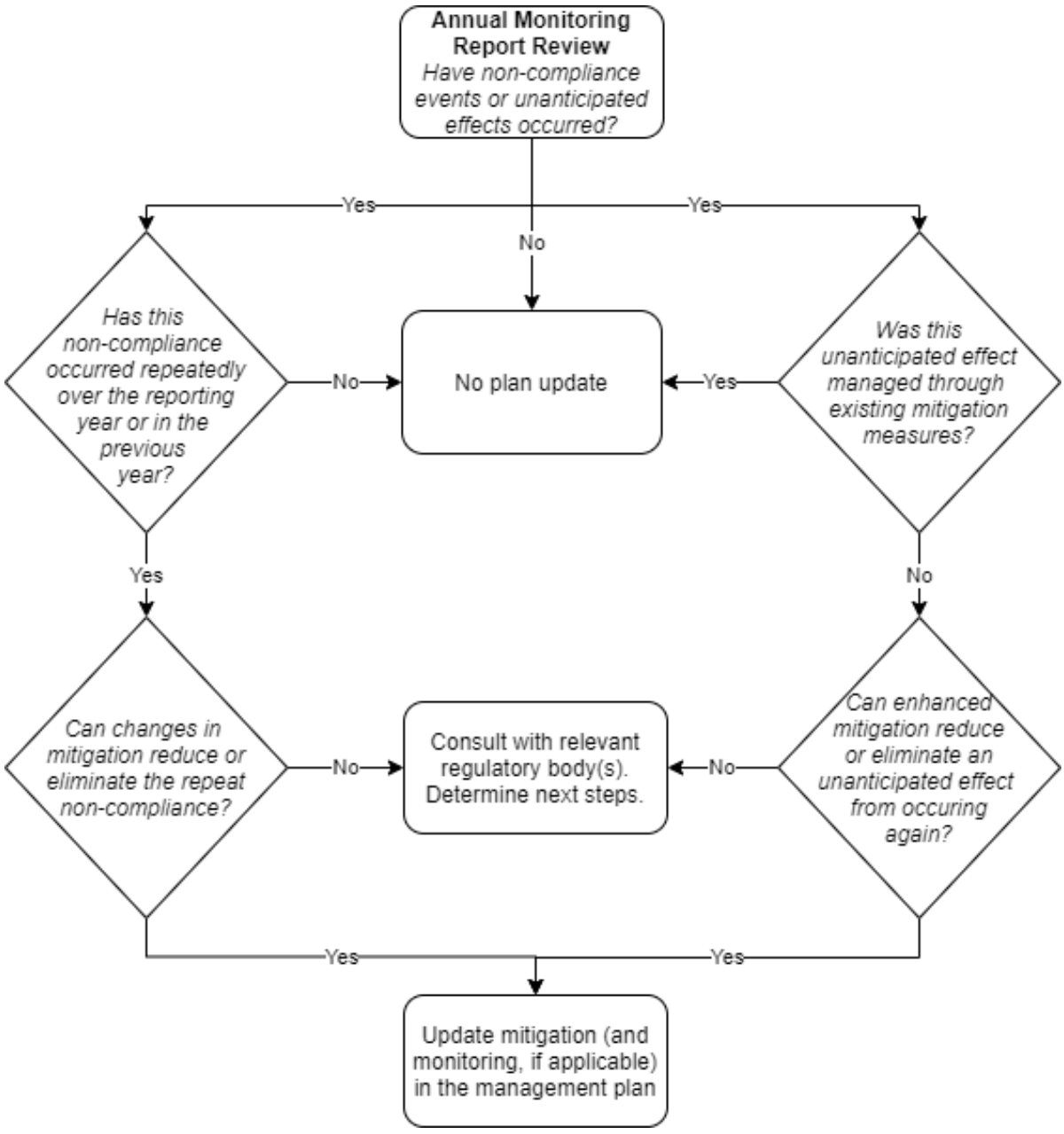


FIGURE 6.1 ANNUAL REVIEW OF PLAN EFFECTIVENESS

7.0 REFERENCES

Baffinland Iron Mines Corporation (Baffinland), 2019. *Adaptive Management Plan (Draft)*. August 23.

Bureau de Normalisation du Quebec, 2015. *National Standard of Canada CAN/BNQ 2910-510/2015 - Explosives - Quantity Distances*. ISBN 978-2-551-25682-2. Standard prepared by the Bureau de normalization due Quebec and approved by the Standards Council of Canada.

Canada Gazette, 2019. *Consolidated Transportation of Dangerous Goods Regulations including Amendment SOR/2019-75*. Canada Gazette, Part II, April 3, 2019. https://www.tc.gc.ca/eng/tdg/clear-download-372.htm.

Canadian Council of Ministers for the Environment (CCME), 2003. *Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products*. ISBN 1-896997-33-3, Copyright: Canadian Council of Ministers of the Environment. https://www.ec.gc.ca/lcpe-cepa/61B26EE8-AFB3-47AC-91AC-12AFBB0B549B/CCME_eng.pdf.

Canadian Environmental Assessment Agency, 2016. *Operational Policy Statement* - Adaptive Management Measures under the *Canadian Environmental Assessment Act.* Retrieved from: https://www.ceaa.gc.ca/default.asp?lang=En&n=F1F30EEF-1. Last modified: July 6, 2016.

Dyno Nobel Baffin Island Inc., 2015. *Emergency Response Assistance Plan for Emulsion Plant, Mary River.* Revised January 23, 2015.

Environment Canada, 2015. *Guideline for the Release of Ammonia Dissolved in Water Found in Wastewater Effluents*. https://www.ec.gc.ca/lcpe-cepa/default.asp?n=B7CE1A5E-1&offset=1. Last updated: May 7 ,2015.

Environment and Natural Resources. *Guidelines for the Management of Biomedical Hazardous materials in the Northwest Territories*. April 2005.

Government of Canada, Minister of Justice, 2015a. *Explosives Act R.S.C., 1985, c. E-17*. Last amended on February 26, 2015. https://laws-lois.justice.gc.ca/eng/acts/e-17/.

Government of Canada, Minister of Justice, 2015b. *Hazardous Materials Information Review Act*. R.S.C. 1985, c. 24 (3rd Supp.), Part III, last amended on February 11, 2015. https://laws-lois.justice.gc.ca/PDF/H-2.7.pdf.

Government of Canada, Minister of Justice, 2017. *Transportation of Dangerous Goods Act*. S.C. 1992, c. 34. Last amended on January 1, 2017. https://lois-laws.justice.gc.ca/eng/acts/T-19.01/.

Government of Canada, Minister of Justice, 2018. *Hazardous Products Act*. R.S.C., 1985, c. H-3. Last amended on May 23, 2018. https://laws-lois.justice.gc.ca/PDF/H-3.pdf.

Government of Nunavut, Department of Justice, 1991. *Transportation of Dangerous Goods Regulations*, 1991. NWT Reg (Nu) 095-91, in force August 1, 1991 (no amendments).

Government of Nunavut, Department of Justice, 2003. *Mine Health and Safety Regulations*. R-125-95 (Current to: October 17, 2011). As amended by Nunavut Reg. R-016-2003, in force February 28, 2003.

Government of Nunavut, Department of Justice, 2006. *Fire Prevention Act*. R.S.N.W.T. 1988,c.F-6. Amended by Nunavut Statute S.Nu. 2006, c.8, in force June 15, 2006.

Government of Nunavut, Department of Justice, 2008. *Mine Health and Safety Act*. S.N.W.T. 1994,c.25 In force December 15, 1995: SI-014-95 (Current to: October 17, 2011) As amended by Nunavut Statute S.Nu. 2007, c.15, s.177(Sch.,s.10) s.177(Sch.,s.10) in force April 1, 2008: SI-003-2008.

Government of Nunavut, Department of Justice, 2010. *Explosives Use Act*. R.S.N.W.T. 1988, c.E-10. Last amended by Nunavut Statutes S.22, March 23, 2010.

Government of Nunavut, Department of Justice, 2011. *Transportation of Dangerous Goods Act*, 1990. R.S.N.W.T. 1988, c.81 Last amended by Nunavut Statutes S.37, March 10, 2011.

Government of Nunavut, Department of Justice, 2015. *Safety Act*. R.S.N.W.T. 1988, c.S-1 (Current to: June 19, 2016), as amended by Nunavut Statute S.Nu. 2015, c.19, in force November 5, 2015.

Government of Nunavut, Department of Justice, 2016. *Occupational Health and Safety Regulations*. R-003-2016, in force March 29, 2016 (Current to: June 19, 2016). https://www.canlii.org/en/nu/laws/regu/nu-reg-003-2016/latest/nu-reg-003-2016.pdf.

Government of Nunavut, 2009. *Environmental Guideline for Contaminated Site Remediation.* March 2009. https://www.gov.nu.ca/sites/default/files/Guideline%20Contaminated%20Site%20Remediation.pdf.

Government of Nunavut, 2010a. *Environmental Guideline for General Management of Hazardous Waste.* October. https://www.gov.nu.ca/environment/documents/general-management-hazardous-wastes-2010.

Government of Nunavut, 2010b. *Environmental Guideline for Mercury-containing Products and Waste Mercury*. November 2010. https://www.gov.nu.ca/sites/default/files/mercury-containing_products_and_waste_mercury_2010.pdf.

Government of Nunavut, 2011a. *Environmental Guideline for Waste Antifreeze.* January 2011. https://www.gov.nu.ca/sites/default/files/waste_antifreeze_2011.pdf.

Government of Nunavut, 2011b. *Environmental Guideline for Waste Asbestos.* January 2011. https://www.gov.nu.ca/sites/default/files/waste_asbestos_2011.pdf.

Government of Nunavut, 2011c. *Environmental Guideline for Waste Batteries.* January 2011. https://www.gov.nu.ca/sites/default/files/waste_batteries_2011_0.pdf.

Government of Nunavut, 2011d. *Environmental Guideline for Waste Solvents.* January 2011. https://www.gov.nu.ca/sites/default/files/waste_solvents_2011.pdf.

Government of Nunavut, 2011e. *Environmental Guideline for Industrial Waste Discharges into Municipal Solid Waste and Sewage Treatment Facilities*. April 2011. https://www.gov.nu.ca/environment/documents/industrial-waste-discharges-municipal-waste-and-sewage-treatment-facilities.

Government of Nunavut, 2011f. *Environmental Guideline for Ozone Depleting Substances.* April 2011. https://www.gov.nu.ca/environment/documents/ozone-depleting-substances-2011.

Government of Nunavut, 2012a. *Environmental Guideline for Used Oil and Waste Fuel.* June 2012. https://www.gov.nu.ca/environment/documents/environmental-guideline-used-oil-and-waste-fuel.

Government of Nunavut, 2012b. Department of Environment. *Environmental Guideline for the Burning and Incineration of Solid Waste*. January 2012. https://www.gov.nu.ca/environment/documents/guideline-burning-and-incineration-solid-waste-2012.

Government of Nunavut, 2014a. *Environmental Guideline for Waste Lead and Lead Paint.* April. https://www.gov.nu.ca/sites/default/files/waste_lead_and_lead_paint_2014.pdf.

Government of Nunavut, 2014b. *Environmental Guideline for Biomedical and Pharmaceutical Waste.* March 2014. https://www.gov.nu.ca/sites/default/files/biomedical_and_pharmaceutical_waste.pdf.

Government of Nunavut. *Department of Environment*. Manager, Pollution Control. Eno, Robert. Personal Communication. 15 Aug. 2008.

National Research Council, 2015. *National Fire Code of Canada 2015*. Ref. No. 15NFC-E.

Northwest Territories (NWT). Municipal and Community Affairs. *Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories*. Prepared by Kent, R., P. Marshall and L. Hawke. Yellowknife: Ferguson Simek Clark, (April 21) 2003.

Nunavut Water Board, 2014. *Type B Water Licence No. 2BE-MRY1421*. April 17, 2014.

Nunavut Water Board, 2015. *Type A Water Licence No. 2AM-MRY1325 – Amendment No. 1*. July 30, 2015.

Appendix A
Corporate Policies

Baffinland Iron Mines Corporation

Health, Safety and Environment Policy

BAF-PH1-800-POL-0001

Rev 2

Approved By: Brian Penney

Title: Chief Executive Officer

Date: April 20th, 2018

Signature: 

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

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.

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
April 2018

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.

Brian Penney
Chief Executive Officer
March 2016

Appendix B
Tables of Concordance with Applicable Permits and Licences

TABLE B.1 CONCORDANCE TABLE WITH TYPE A WATER LICENCE (2AM-MRY1325) CONDITIONS

Part	Number	Condition	Section
D	20	The Licensee shall prevent any chemicals, fuel or wastes associated with the undertaking from entering any Water body.	Section 3.5
F	5	The Board has approved with the issuance of the licence, the Plan entitled "Baffinland Iron Mines Corporation Mary River Project Hazardous Materials and Hazardous Waste Management Plan", dated April 22, 2013.	N/A
F	6	The Licensee shall locate areas designated for waste disposal at a minimum distance of thirty-one (31) meters from the ordinary High Water Mark of any water body such that the quality, quantity or flow of water is not impaired, unless otherwise approved by the Board in writing.	Section 3 Section 3.5.6.2
F	11	The Licensee shall submit to the Board and the Inspector, thirty (30) days prior to the removal and transfer of waste, a declaration of authorization from any community receiving waste from the project, which clearly states that authorization has been granted for the deposit by the Licensee at the Hamlet's appropriately licensed facilities.	Section 3.5.7
F	14	The Licensee shall remove any waste generated from temporary and permanent shelters along the tote road and along the railway corridor for treatment at appropriately licenced Waste Management Facilities.	Section 3.5.6
F	29	The Licensee shall remove from the project site, all hazardous wastes generated through the course of the Construction and Operations Phases, for disposal at an approved Waste Disposal Facility.	Section 3.5.5 Section 3.5.7
F	30	The Licensee shall maintain records of all Waste backhauled from the Mary River Project and confirmation of proper disposal through the use of Waste manifest tracking systems and registration with the Government of Nunavut, Department of Environment. These records shall be made available upon request, to an Inspector or the Board.	Section 3.5.7

TABLE B.2 CONCORDANCE TABLE WITH TYPE B WATER LICENCE (2BE-MRY1421) CONDITIONS

Part	Number	Condition	Section
D	6	The Licensee shall backhaul and dispose of all hazardous wastes, waste oil and non-combustible waste generated through the course of operation at a licensed waste disposal facility.	Section 3.5.5 Section 3.5.7
D	6	The Licensee shall maintain records of all waste backhauled and records of confirmation of proper disposal of backhauled waste. These records shall be made available to an Inspector or the Board upon request.	Section 3.5.7

Appendix C
Adaptive Management

C ADAPTIVE MANAGEMENT

C.1 PRINCIPLES OF ADAPTIVE MANAGEMENT

C.1.1 DEFINING THE ADAPTIVE MANAGEMENT PROCESS

Adaptive management is a planned and systematic process for continuously improving environmental management practices by learning about their outcomes (Canadian Environmental Assessment Agency, 2016). Adaptive management provides flexibility to identify and implement new mitigation measures or to modify existing ones during the life of a project.

Baffinland has developed an Adaptive Management Plan (AMP) that provides the framework by which adaptive management is to be incorporated into Project operations (Baffinland, 2019). The adaptive management process is iterative and starts with a planning phase; followed by implementation of monitoring; ongoing evaluation of the effectiveness of the plans based on monitoring results; and adjustment of the management strategies and responses as needed. This process is illustrated on Figure C.1.

C.1.2 CONCEPTUAL RESPONSE FRAMEWORK

The AMP establishes a systematic approach to respond to monitoring results through the establishment of a conceptual response framework that includes:

- Establishment of thresholds, and in some instances, early warning triggers
- Monitoring of key indicators relative to triggers and thresholds
- Specific pre-defined actions to be implemented if triggers or thresholds are exceeded
- A required follow-up process to evaluate, learn and adjust plans

The thresholds are defined in the individual management plans and may be qualitative or quantitative. For key indicators with quantitative thresholds, early warning triggers may be defined to initiate precautionary actions.

The response framework identifies the following action levels to be taken in response to exceedances of thresholds:

- **Low Action -** Implemented if monitoring shows that indicators are moving away from baseline conditions or predicted levels; actions could include investigating the change to determine a cause and/or assessing if additional monitoring is needed.
- **Moderate Action -** Implemented if there is a significant difference between reference and exposure areas or if effects appear to be trending toward a defined threshold; actions could include confirming and investigating the effect or evaluating the effectiveness of mitigation.
- **High Action -** When effects are well above those predicted and beyond defined thresholds; in this case actions could include applying more intensive mitigation measures or implementing restoration measures to reverse the effects.

FIGURE C.1 BAFFINLAND'S ADAPTIVE MANAGEMENT PROCESS

C.1.3 ADAPTIVE MANAGEMENT CHECKLIST FOR ENVIRONMENTAL MANAGEMENT

Checklists have been developed and populated for each management plan that describe how adaptive management has been incorporated into each management plan. 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 below.

C.1.4 ENGAGEMENT IN THE ADAPTIVE MANAGEMENT PROCESS

An effective AMP relies on ongoing communication with the appropriate external parties. A key part of Baffinland's approach to adaptive management is incorporation of community review and feedback to improve or extend the effectiveness of the Environmental Management System (EMS) for the Project. Baffinland's recently developed Inuit Qaujimanituqangit (IQ) Management Framework proposes the establishment of an Inuit Committee to participate in the adaptive management process of environmental management on the Project. The interaction of the Inuit Committee with the Adaptive Management Plan and the EMS centres around the integration of IQ to the extent possible, as shown on Figure C.2.

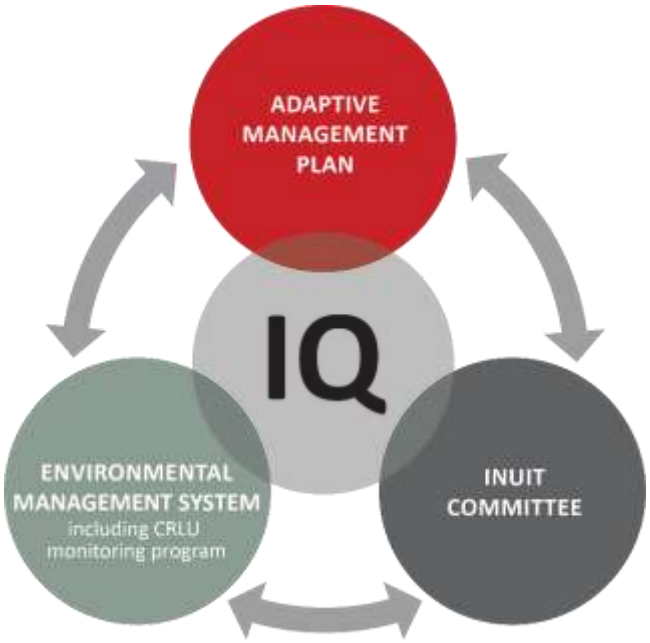


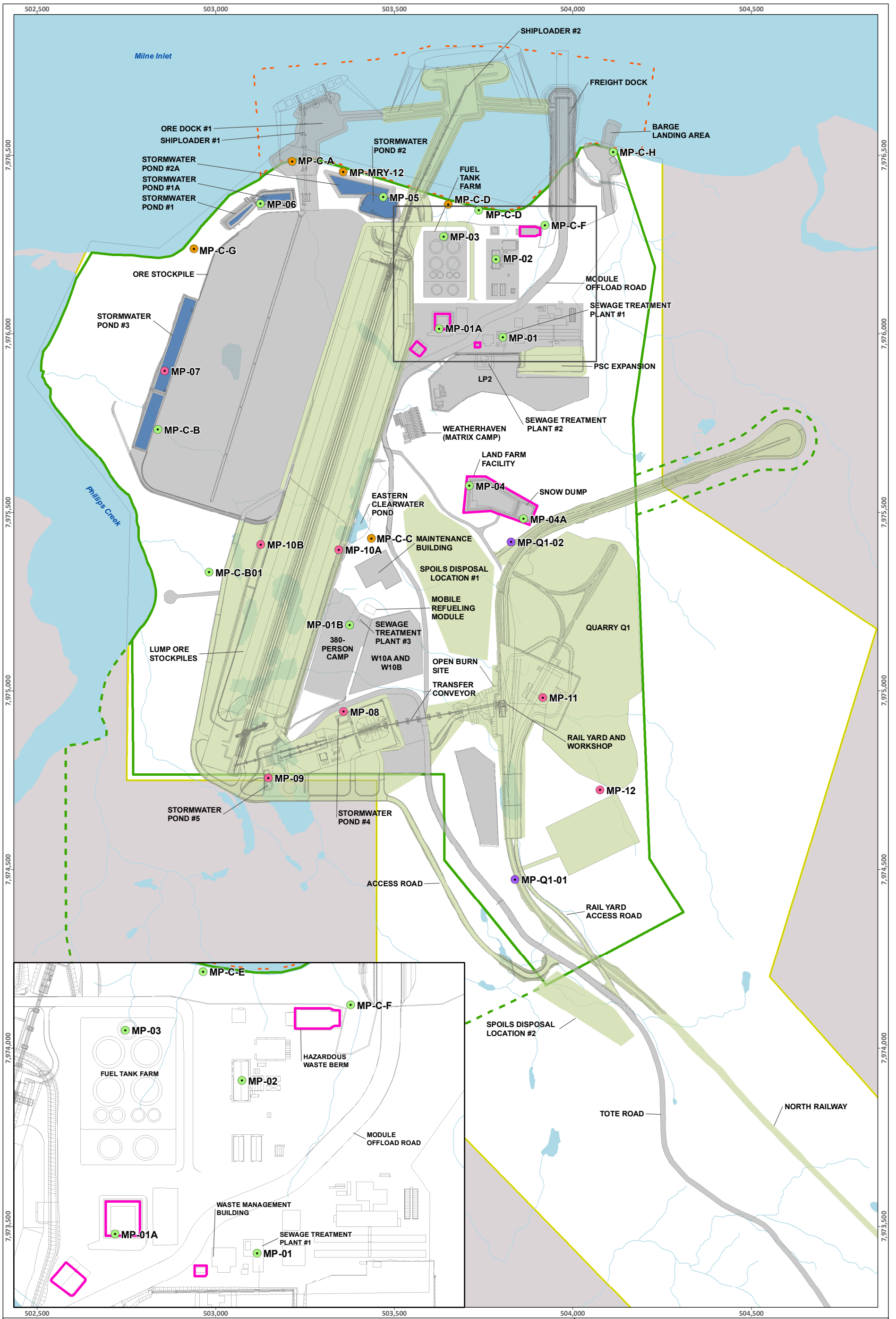
FIGURE C.2 INCORPORATION OF IQ IN ADAPTIVE MANAGEMENT

Existing advisory groups will also contribute to the adaptive management process; this includes:

- Marine Environment Working Group (MEWG)
- Terrestrial Environment Working Group (TEWG)
- Socio-economic Working Group (SEWG)

These advisory groups already review and discuss monitoring results with Baffinland on an annual or semi-annual basis and have provided important feedback that have resulted in modifications to mitigation measures and/or monitoring programs.

Appendix D
Site Layouts: Mine Site and Milne Port



LEGEND

- Proposed Phase 2 Surveillance Network Program (SNP) Station
- Water Licence Surveillance Network Program (SNP) Station
- Monitored not officially SNP (Requested to add to SNP in Water Licence Application)
- Inactive
- Waste Storage Area
- Foreshore Lease Boundary
- Project Development Area
- Commercial Lease Boundary
- Approved Infrastructure
- Additional Phase 2 Proposal Infrastructure

MARY RIVER PROJECT

Milne Port Waste Storage Areas - Phase 2 Proposal

Projection: NAD 1983 UTM ZONE 17N.

0 50 100 200 Meters
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Baffinland

FIGURE 1

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EMULSION PLANT
AMMONIUM NITRATE STORAGE
MS-08
ULTIMATE WASTE ROCK STOCKPILE
OPEN BURN SITE
MS-MRY-10
MS-MRY-9
HAUL ROAD
WEST STORMWATER POND
WATER PUMPHOUSE
MS-MRY-1
MS-MRY-6
MS-MRY-4
MQ-C-A
MQ-C-D
Camp Lake
EXPLORATION CAMP AREA
MS-MRY-4A, B, C
ULTIMATE DEPOSIT 1 PIT LIMITS
AIRSTRIP
MQ-C-B
ORE HAUL TRUCK PAD
LAYDOWN AREA
ROM STOCKPILES
45 ML TANK FARM
MS-C-A
MS-C-B
MS-03B
MINE SITE COMPLEX POWER PLANT
QUARRY D1Q2
MS-07
EXPLOSIVE MAGAZINE
Mary River Tributary F
MS-C-E
MS-03
MS-C-F
SAILIIVIK CAMP
MS-MRY-11
MS-01B
MS-01
MS-02
Mary Lake
Sheardown Lake NW
MS-C-D
MS-C-C
STACKER/ RECLAIMER
MS-06B
CRUSHER FACILITY SEDIMENTATION POND
MS-06
Mary River
MQ-C-E
SECONDARY CRUSHER BUILDING
NORTH RAIL CRUSHER FACILITY AND RAIL LOAD OUT
18 Mtpa ORE STOCKPILES
OVERLAND CONVEYOR
MS-MRY-13B
MS-MRY-13A
EXISTING LANDFILL
MS-05
MS-05B
MS-C-H
EFFLUENT DISCHARGE POINT
Sheardown Lake SE
MS-C-G
EMULSION PLANT

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LEGEND

- Proposed Phase 2 Surveillance Network Program (SNP) Station
- Water Licence Surveillance Network Program (SNP) Station
- Monitored not officially SNP (Requested to add to SNP in Water Licence Application)
- Inactive
- Waste Storage Area
- Borrow Area
- Quarry Area
- Infrastructure
- Project Development Area
- Commercial Lease Boundary
- Approved Infrastructure
- Additional Phase 2 Proposed Infrastructure

ᓄᓇᕗᑦ ᐅᓴᖏᓐᓄᑦ MARY RIVER PROJECT

Mine Site Waste Storage Areas - Phase 2 Proposal

Projection: NAD 1983 UTM ZONE 17N.
Base Map: © Her Majesty the Queen in rights of Canada Department of Natural Resources (2009). All rights reserved.

0 195 390 780 Meters
Scale 1:30,000

N

Baffinland

ᑎᑎᕋᐅᓯᖅ FIGURE 2