BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT

2013 COMPREHENSIVE ENVIRONMENTAL MONITORING PLAN

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TRACK CHANGES TABLE

An annual routine review and update of the Comprehensive Environmental Monitoring Plan has been undertaken, with the following salient revisions to the March 2013 Comprehensive Environmental Monitoring Plan: Revision 0: March 2013

Modifications/Additions	Where they appear in the document	
	Section	Page number
Description of the Mary River Project site was updated to reflect current configuration and site activities (site preparation activities)	1.0	1
Section 1.4 was revised to reflect the submission if the Final Environmental Impact Statement (FEIS) and receipt of Project Certificate	1.4	2
Section 2.2 was revised to reflect the programs undertaken during the 2012 season and to update the table of authorizations.	2.2	4
Section 3.1 was revised to reflect the changes to the organizational structure.	3.1	6
Section 4.3 was updated to include the management plan revisions.	4.1	10
Section 4.3.5 was updated to include operational plans for quarry development.	4.3.5	11
Section 4.3.7 was added to outline the Laydown Areas and Camp Facility Pads.	4.3.7	13
Section 4.4.1 was updated to include the work completed during 2012.	4.4.1	14
Section 4.7 includes updated management plans.	4.7	20
Section 4.7.5 was updated to include additional water quality monitoring locations associated with the site preparation works prior to sea lift.	4.7.5	22
Section 4.7.6 was updated to include the MRY-13 monitoring location.	4.7.6	22
Table 2.1 was revised to reflect the current Status of Compliance with Conditions, Approvals and Commitments.	Table 2.1	End of Document
Table 4.2 was revised to reflect updated water quality monitoring locations.	Table 4.2	End of Document
Appendix A was added to include the 2013 work plan.	Appendix A	End of Document
Appendix B was added to include site drainage drawings.	Appendix B	End of Document
Appendix C was added to include the Baffinland's QA/QC plan for water quality.	Appendix C	End of Document

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COMPREHENSIVE ENVIRONMENTAL MONITORING PLAN

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COMPREHENSIVE ENVIRONMENTAL MONITORING PLAN

SECTION 1.0 - INTRODUCTION

1.1 PURPOSE

This Comprehensive Environmental Monitoring Plan (CEMP) has been developed for the Project, with the following objectives:

- Integrate outcomes of the environmental review process (NIRB Environmental Screening)
- Assess the effectiveness of proposed mitigation and to adapt accordingly
- Facilitate compliance with applicable regulations and requirements of environmental permits
- Enhance the awareness of project personnel to environmental commitments and requirements
- Support the on-going collection of baseline environmental data

In accordance with Part B, Item 6 of Baffinland's Type B Water Licence No. 2BB-MRY1114 for the Mary River Project, an annual review of the project environmental management and monitoring plans developed under the licence needs to be undertaken. The year 2013 is a regulatory transition year that will see the granting of a new Type B licence (likely early May) to allow for the site preparation that includes the construction of limited infrastructure prior to the anticipated receipt of the Type A Water Licence (likely late June or early July). In consideration of this, project environmental management plans have been updated to support the 2013 Work Plan (see Appendix B for copy of Work Plan) which spans the applicability between the existing Type B Water Licence, proposed new Type B Water Licence, as well as the incorporation of the proposed Type A Water Licence. It is recognized that there may be requirements to further update project environmental management plans based on the specific terms and conditions of approval of the proposed Type A Water Licence and new QIA commercial lease once known.

The Comprehensive Environmental Monitoring Plan (the Plan) is an update to the March 2012 version of the plan and supports activities of the 2013 Work Plan under the existing Type B Water Licence and future Type B (in process). This Plan will apply to the site preparation activities prior to receipt of the new Type A in late June or early July. Once the Type A Water Licence is issued, a revised Environmental Monitoring Plan will be developed that reflects the specific terms and conditions of the Type A Licence and outcomes of various Working Groups that are currently meeting to discuss environmental monitoring.

In this plan, the designations for the camps have been modified from previous years so as to be in alignment with the terminologies used in the documentation for the approved Project. Throughout this plan the following changes in designations have been made adopted:

- Milne Inlet Camp site is now termed Milne Port;
- Mary River Camp site is now termed Mine Site; and
- Steensby Inlet Camp Site is now termed Steensby Port.

The location of the main project activities are shown on Figure 1.1. The layout of the camp facilities at Milne Port, Mine Site, Mid Rail and Steensby Port are shown Figures 1.2, 1.3, 1.4 and 1.5 respectively. Figure 1.6 shows the alignment of the Milne Inlet Tote Road.

The CEMP is a 'living document' that will be regularly updated as the Project progresses, empirical field experience is gained, and mitigation measures evolve in the spirit of adaptive management. This version of the CEMP has been developed to reflect the activities that were undertaken during the period from 2008 to 2012 as well as those planned for 2013.

1.2 SCOPE OF THE MONITORING PROGRAM

The following, as applicable, will be monitored:

- Compliance with the terms and conditions of licenses, permits and authorizations, as well as commitments outlined in the NIRB Environmental Screening Decisions (ESD)
- Activities in and around water, to ensure the protection of fish and fish habitat
- The presence and response of wildlife to Project activities
- Water sources for potable water consumption, treated sewage effluent prior to discharge, and receiving waters
- General site drainage in proximity to key site infrastructure and activities including roads and fuel storage areas
- Employment history and skills development of employees
- Continued collection of environmental and socio-economic baseline data

Each of the above components of the monitoring plan is described in the sections that follow. Abandonment and reclamation of the project and the associated monitoring is described in the "Abandonment and Reclamation Plan".

1.3 ENVIRONMENTAL PROTECTION PLAN

An Environmental Protection Plan (EPP) has been developed for use by managers and field supervisors in raising awareness and guiding project personnel in the execution of the Mary River Project in a way that protects the environment and honours the legal requirements and commitments Baffinland has made for the project. The EPP consists of Operational Standards addressing how the variety of activities shall be conducted during the project to adhere to regulatory requirements and Owner's commitments. The EPP is the "hands-on" aspect of the CEMP to be distributed to all managers and supervisors.

1.4 ENVIRONMENTAL IMPACT STATEMENT

Ongoing baseline data collection was also completed in accordance with the commitments made in the Final Environmental Impact Statement (FEIS). The Final EIS was submitted to the NIRB on February 13, 2012, and formerly accepted in early March 2012. The Project Certificate (No. 005) from the NIRB was issued in late December 2012.

Subject to regulatory approval, site preparation will commence prior to the 2013 sea lift. The site preparation works that are proposed include the following, starting in early May 2013:

- Begin development of Quarry Q1 1+100 at Milne Port site, and Quarry QMR2 located at the Mary River Mine Site.
- Construct camp facility pads at both the Mary River Mine Site and at the Milne Port site, as well as begin installation of construction camps and associated camp facilities.
- Begin development of two laydown areas (Laydowns A and B) at Milne Port for the storage of equipment and supplies being delivered via the summer sealifts.
- Expand existing camp sewage facilities (additional PWSP) at Milne Port that will provide additional capacity with respect to the sewage treatment system. Note that these facilities will not be used until the issuance of the Mary River Type A Water Licence.
- Expand existing fuel tank secondary containment area at Milne Port for future construction of additional steel tanks. The new steel tanks would not be constructed until the receipt of the new Type A Licence.
- Construct one additional 5ML diesel fuel storage tank at Milne Port within the existing secondary containment constructed in 2011 (same construction as the existing 5ML tank). Note that the fuel tank will not be filled until issuance of the Mary River Type A Water Licence.

SECTION 2.0 - OWNER'S COMMITMENTS AND REGULATORY REQUIREMENTS

Baffinland is committed to conducting its work in a manner that minimizes potential impacts to the natural environment and contributes to positive social and economic effects, particularly as they relate to communities in the North Baffin region. Baffinland seeks to ensure that its activities and procedures meet these commitments and regulatory requirements, and that the commitments and requirements are understood, implemented and maintained by personnel at all levels involved with the Project.

2.1 OWNER'S COMMITMENTS DURING PROJECT SCREENING

Owner's Commitments refer to those statements/commitments made by Baffinland during the course of the environmental screening and/or discussions with Inuit organizations, government agencies and communities. Commitments made during the screening of both the exploration and geotechnical program, as well as the bulk sampling program, are included in Table 2.1.

2.2 REGULATORY REQUIREMENTS

Regulatory requirements refer to both the terms and conditions of permits and licences that have been issued to Baffinland, as well as applicable legislation (acts and regulations). Table 2.1 lists the Owner's commitments as well as the terms and conditions for the exploration, geotechnical program, and the bulk sampling program. The table will be updated when there are changes or additions to relevant regulatory requirements. Baffinland will assign responsibility for fulfilling these commitments to the appropriate personnel, when applicable. Table 2.2 lists the applicable legislation (acts and regulations) as well as guidelines, which have been identified to be applicable to the Project.

Exploration is focused on Federal Mineral Leases 2483, 2484 and 2485 (Deposit Nos. 1 to 4, incl.), shown on Figure 1.1. The leases are in good standing until August 2013. During 2012, an exploration drilling program involving one drill was undertaken on Deposit No. 1 during the months of June and July to collect data primarily for the purpose of further geochemical characterization and runoff quality predictions from the future waste rock pile and the open pit. Also during 2012, an advanced regional exploration program focusing on iron ore deposit Nos. 3 to 9 was conducted. Exploration activities included ground based magnetic surveys, property scale mapping, and advanced reconnaissance prospecting. On-going mineral exploration and geotechnical studies, along with the bulk sample program are governed by the terms and conditions in the authorizations shown below.

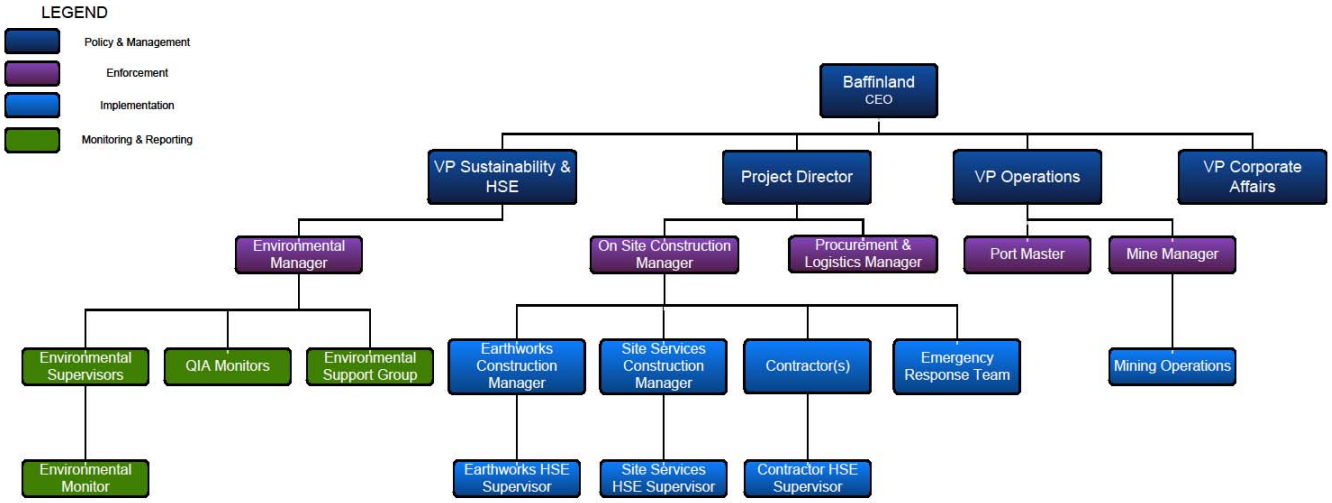
The CEMP is written to reflect the Terms and Conditions of these authorizations, and is updated as required to incorporate any changes in these terms and conditions as well as extensions, amendments or additional authorizations that are obtained. Relevant aspects of these approvals have also been incorporated into the EPP. Adherence to the EPP is the best guide to ensure compliance with the various acts and regulations that apply to the Project.

In the unlikely event that changes to legislation occur during the life of this document, the CEMP will be reviewed and amended as appropriate.

The key project permits and licences are listed below:

Project Permits and Licences

Type of Authorization	Approval No.	Authorizing Agency	Governing Activity	Period Valid
Water License (Type "B")	2BB-MRY1114	NWB	Water use and waste disposal	April 5, 2011 to April 5, 2014
Land Use Permit	N2006C0036	AANDC	Exploration and Geotechnical Activities on Crown Land	April 3, 2012 to April 3, 2014
Land Use Permit	N2007F0004	AANDC	Road Construction on Crown Land	July 4, 2012 to July 4, 2014
Commercial Lease for Inuit Owned Lands, Quarry Concession Agreement (Inuit Owned Lands)	Q10C3001	QIA	Mining and exploration activities and use of borrow and quarry materials on Inuit Owned Land	October 31, 2010 to December 31, 2013
Quarry Permit	2012QP0065	AANDC	Quarrying on Crown Land	July 4, 2012 to July 4, 2013
DFO Letter of Advice	File NU-06-0084, dated July 25, 2007, and subsequent	DFO	Crossing installations at Category Small Watercourses and Subsequent Modifications	Not applicable
HADD Authorization *Fisheries Act* S.35(2) and four amendments	File NU-06-0084, dated August 3, 2007	DFO	Crossing installations within fish habitat at 25 watercourses	No Expiry
Navigable Waters Protection Act Approval	8200-09-10415 8200-09-10425 8200-09-10414 8200-09-10424	Transport Canada	Construction of crossings in four (4) navigable waters	June 22, 2009 to June 30, 2015
NIRB Project Certificate	005	NIRB	Approval of Mary River Project FEIS	Issued December 28, 2012
New Type B Water Licence	Application submitted March 11, 2013	NWB	To permit site preparation work prior to receipt of Type A Water Licence	In Process
New Type A Water Licence	Application submitted February 2012	NWB	Mary River Project Construction and Operations Phases	In Process
New QIA Commercial/Production Lease	Currently being negotiated	QIA	Mary River Project Construction and Operations Phases	In Process



SECTION 3.0 - ROLES AND RESPONSIBILITIES

3.1 ORGANIZATIONAL STRUCTURE

The Sustainable Development department is responsible for environmental management, including ensuring compliance with applicable regulations and permit requirements through on-going monitoring, and the development and implementation of operational standards, procedures and employee training. Roles and responsibilities for implementation of the CEMP and the companion EPP are described in Table 3.1.

3.2 MONITORING AND INSPECTION

A summary of the monitoring and inspection requirements described in Section 4 of this Plan is provided in Table 3.2. Responsibilities have been assigned to various personnel on the Project team. Where required, third party resources will be retained to supplement in-house resources and capabilities.

3.3 COMMUNICATION

The types of communications for which members of the team will participate include the following:

a) Formal written correspondence and meetings with stakeholders
b) Site visits by community representatives
c) Design, construction and planning meetings
d) Field inspections and monitoring reports disseminated by the Environmental Health & Safety Superintendent
e) Electronic communications
f) Tailgate/toolbox meetings
g) Formal written correspondence and meetings with government regulatory bodies
h) Formal environmental awareness training

Communications will be appropriately recorded and filed for future reference. Where appropriate, the copies of communications will be forwarded to the Operations Manager(s), and Vice President Sustainability.

3.4 TRAINING AND AWARENESS

Staff and sub-contractors working on site will receive environmental training as part of the Site Orientation, to achieve a basic level of environmental awareness understanding of their obligations regarding compliance with regulatory requirements, commitments and best practices.

Operations Managers, Site Managers and contractor supervisors will be provided this CEMP, and will receive additional orientation with respect to the requirements outlined in the CEMP. In addition, supervising level staff and sub-contractors will be provided with the Operational Standards (the EPP) as a written guidance for their work.

Targeted environmental awareness training will be provided to both individuals and groups of workers assuming a specific authority or responsibility for environmental management or those undertaking an activity with an elevated high risk of environmental impact, such as in-water work at watercourse crossings. These will be delivered in the form of toolbox/tailgate meetings or other means as appropriate.

The content of the environmental component of the site induction will include at a minimum:

a) Location of environmental sensitivities
b) Location of additional information on environmental matters
c) Due diligence responsibilities
d) Responsibilities related to waste management, minimizing noise as necessary, road traffic rules, etc.
e) Principles and necessary steps to avoid encounters with bears or other wildlife and what to do if one such encounter occurs

3.5 EXTERNAL COMMUNICATIONS

Effective forms of communication include the proactive notification to external stakeholders of Project activity. Project activity updates will be provided to the communities of North Baffin through various means including regular meetings, public notices and radio announcements as appropriate. Baffinland will maintain Community Liaison Offices to assist in this regard. Shipping notification will be provided to Nunavut Tourism for dissemination to tourist operators in the region.

SECTION 4.0 - MONITORING PROGRAM

The monitoring program described in the sections below has been updated to reflect activities reasonably expected to be undertaken post shipment of the bulk sample in 2008, up to and including limited site preparation activities in advance of the 2013 sea lift and the commencement of mine construction under a Type A Water Licence and new QIA Commercial/Production Lease. The design and associated results of monitoring programs undertaken in previous years are provided in various regulatory reports, most notably the NIRB and NWB annual reports for 2007 through to 2012.

4.1 METEOROLOGY

Three meteorological stations have been established, with one at the Mine Site and one at each of Steensby Port and Milne Port locations. The stations record air temperature, relative humidity, precipitation, wind direction and wind speed. The data collected from the meteorological stations is establishing a climatic record at key project areas.

During 2009, each station was retrofitted with new research technology being tested to determine its ability to transfer data remotely in real time. Due to operational challenges and difficulties, the satellite upload units were removed from the Milne Port and Steensby Port sites in 2011. Improvements and enhancements to the existing systems were implemented during the 2012 field season and the meteorological stations continue to provide a useful database of weather records at the sites that can be helpful for predicting future weather events and assist in engineered design development for various project components.

4.2 AIR QUALITY AND NOISE

Potential sources of project related effects to air quality include exhaust emissions from vehicles, aircraft, generators and other equipment, emissions from camp incinerators, and fugitive dust emissions from road traffic during the snow-free periods. In 2007 and 2008 there were additional sources of potential air related effects associated with bulk sample activities including fugitive dust emissions from mining/blasting, crushing, conveying and stockpiling activities. These sources were also contributors to the generation of project related noise.

4.2.1 Ambient Air Quality Monitoring

Passive and active air quality monitoring was conducted during the period that the bulk sample was mined and shipped. Active monitoring involved the measurement of total suspended particulate matter (TSP) and various metal concentrations at areas of activity including the Mine Site and airstrip, bulk sample pit, crusher, Mine Site airstrip, crusher, haul road, and along the Milne Inlet Tote Road. Passive sampling included the collection of SO_2, NO_2, O_3, and dustfall samples simultaneously at the Mine Site airstrip, the crusher, and along the Milne Inlet Tote Road. This monitoring was conducted specifically in support of the bulk sample program and for the collection of empirical information to support full-scale project planning. Continued monitoring is not required at this point in time.

4.2.2 Incinerator Emission Testing

Non-hazardous camp wastes, not otherwise scheduled for off-site disposal/recycling or that are not suitable for disposal in the on-site landfill are disposed of in the camp incinerators. Incinerated wastes are generally those generated from the kitchen and personnel accommodations.

Camp incinerators are installed at each of the camps associated with the Mary River Project, namely Milne Port, Mine Site, Mid-Rail and Steensby Port. Each of these incinerators utilizes dual chamber, variable air flow design technology and is specifically designed for remote camp operations. The manufacturers of these incinerators indicate that these incinerators are capable of meeting the Canadian Council of Ministers of the Environment (CCME), Canada Wide Standards (CWS) for Mercury Emissions and the CCME CWS for Dioxins and Furans.

The waste incinerators are operated on an as required basis. Standard operating procedures have been developed in accordance with the manufacturer's recommendations and operators receive training by experienced supervisory personnel. Incinerator ash that is generated is stored on-site in 200 L drums for future disposal in the on-site landfill after the completion of a leachate toxicity testing program.

The incinerator at the Mine Site is the largest unit on-site and was replaced in 2008 as the previous incinerator had reached the end of its useful life. An emissions test was completed on this older unit in 2007. A discrete stack test of the new incinerator at the Mine Site was undertaken in 2008 and 2009 to provide an indication of potential emission characteristics from incineration activities at each of the camps. Testing was completed for dioxins/furans including mercury.

Incinerator monitoring will continue to be undertaken. An emphasis has been placed on procurement policies and the application of consistent operating practices to reduce the risk of poor quality emissions. A report completed by RWDI and presented in the 2011 NIRB Annual Report (January 2011) provided an analyses of historical testing results, operating practices and on-site waste management activities. It also provided recommendations for improvements to incineration operating and management practices that will be implemented.

4.2.3 Noise

A noise monitoring program was undertaken at the Mine Site during the bulk sampling program. The purpose of the monitoring program was to assess the magnitude of noise impacts from the activities. In the absence of Nunavut-specific noise guidelines, the Alberta Energy and Utilities Board guidelines were used for comparative purposes. The three main activities that were expected to cause the main noise impacts included the Mine Site operations (including vehicles, generators, incinerators, etc.), aircraft activities, as well as mining, crushing and transportation activities related to bulk sample extraction. This monitoring was conducted specifically in support of the bulk sample program and for the collection of empirical information to support full-scale project planning. Continued monitoring is not required at this point in time.

Noise emissions associated with on-going site activities will be localized and will be generated by camp operations, equipment operation and frequent aircraft take offs and landings. Field activities will be conducted in accordance with the EPP to minimize potential effects to people and wildlife. More specifically, equipment will be operated with modern mufflers, aircraft will fly above minimum prescribed heights, and drilling and other site activities will be guided by the presence and response of wildlife.

4.3 LANDFORMS

The bulk sample program required the disturbance of surface landforms through cut and fill operations associated with road construction and excavations in borrow locations. Culverts were installed in the roadways at drainages and water crossings. A single pit on the top of Deposit No. 1 was advanced to extract the bulk sample. Other civil infrastructure was also constructed, most notably were lined polishing waste stabilization ponds (PWSPs) to accept effluent from the Milne Port and Mine Site sewage treatment facilities and lined bulk fuel storage containment areas. Landforms associated with the bulk sample project have and will continue to be inspected on a regular basis to confirm suitable physical stability conditions remain. This will include inspection of disturbed areas to ensure the effectiveness of sediment and erosion control measures, the physical stability of open pit slopes and stockpiles including those of ice rich soils. Monitoring of disturbed areas will continue through post-closure as described in the Abandonment and Reclamation Plan.

Environmental protection measures in the EPP define the measures to be employed during construction, to ensure that impacts to the environment and receiving waters are protected from contaminated runoff and increased sediment loadings.

The construction and on-going operations of the Mary River Project will result in soil disturbance and water diversions that require sediment and erosion control planning to prevent the discharge of soil contact water. Best management practices, including preventative measures, will be used throughout the duration of the Project. This section details measures that will be used to mitigate potential environmental impacts arising from the storage and discharge of site contact water. To further support these works, the following management plans have also been developed:

- Emergency Response and Spill Contingency Plan;
- Surface Water and Aquatic Ecosystems Management Plan; and,
- Wastewater Management Plan.

4.3.1 Bulk Sample Pit

The bulk sample pit was constructed as a side-hill cut and was confirmed by land survey at its completion in 2008 to be free-draining. The bulk sample pit was designed to be free-draining so as to reduce any risk for poor water quality run-off. Periodic monitoring of the pit indicated that the pit floor was free draining. The pit will continue to be inspected on an annual basis to ensure the pit slopes will be stable in the long term.

4.3.2 Stockpiles

The bulk sample program generated stockpiles of ore adjacent to the pit at Deposit No.1, at the crusher site at the base of Deposit No.1, and at Milne Port where the ore was loaded for shipment in 2008. These stockpiles are expected to be stable in the long term. Monitoring of run-off water quality is discussed in Section 4.7.

4.3.3 Road Embankment Construction

Upgrades necessary to support the hauling of the bulk sample were completed to the Milne Inlet Tote Road in 2007 and 2008 by adding fill to the roadbed, cutting and filling on hills, and installing crossing structures (mainly culverts) at watercourses and drainages. Similar work was undertaken to construct a haul road from the ridgeline on Deposit No. 1 to the crusher location. Fill from the areas immediately adjacent to the embankment and from designated large borrow areas was placed to form various road embankment thickness depending on the frost/thaw susceptibility of the underlying foundation soils.

The design of the watercourse crossings is such that, during summer, heavy flows overtop some of the culvert crossings equipped with overflow swales. This can result in some erosion and siltation, and efforts have been made in 2009 and 2010 to improve environmental performance of a number of crossings where this has occurred. These conditions were improved in 2011 with continued Tote Road maintenance and upgrades which helped to reduce safety and environmental risks and improve on overall performance.

It is intended that the Milne Inlet Tote Road will continue to provide all-season access to the Mine Site until after proposed construction of the full-scale Mary River Project when it may be used to haul ore to Milne Port assuming the haul road option is advanced. Prior to mine construction, the road will be used to facilitate transport of fuel, supplies, and equipment to support on-going exploration as well as pre-construction staging efforts. The road is expected to require regular maintenance including snow clearing during the winter months (when in use) as well as culvert and crossing maintenance and during the summer period.

Inspections will continue to be undertaken to monitor the physical stability and any environmental concerns related to the road and associated water crossings and borrow areas.

4.3.4 Borrow Area Development

Fill materials needed for upgrades of the Milne Inlet Tote Road, the mine haul road, and other civil works has been obtained from designated large borrow areas and from within the road alignment.

Borrow material is obtained by shallow and broad stripping of the active layer without blasting and concentrated during the summer and fall. The stripping of the active layer results in a thawing of the underlying permafrost and eventually a re-establishment of a new active layer and permafrost depth. A release of excess moisture is expected with the thawing process, particularly if ice lenses are present. This thawing and release of moisture will be accompanied by settlement, the degree of which may vary from location to location based on the relative presence of ice lenses and topography.

During 2009, a field study conducted by a geotechnical engineering consultant was initiated to establish preliminary closure criteria for the Tote Road borrow areas and to confirm that as-built conditions are suitable for eventual decommissioning. The borrow pits were prioritized based on the established criteria and an action plan developed to reclaim the pits on a priority basis. During 2010, remedial action was initiated with the strategic placement of new embankment material on and adjacent to the road fill in areas where on-going thaw is compromising the stability of the road and nearby terrain.

The reclamation effort may take several years of regrading, fill placement, monitoring, and adaptation to achieve acceptable long term condition. The monitoring program will continue to be undertaken to confirm stability of the borrow areas.

4.3.5 Rock Quarries

The NIRB Project Certificate included the detailed assessment of 5 quarries. Two (2) rock Quarries have been previously designated and approved for use under the existing QIA Commercial Lease and will be developed at the onset of the 2013 Work Plan (Appendix A). Quarrying will not occur within 30 m of a watercourse, and drainage will be re-established as necessary during quarry development. Any rock faces will be inspected by a geotechnical engineer to ensure physical stability. Ditching and other drainage measures will be established as needed to limit erosion and maintain positive drainage to minimize water ponding. Contouring, ditching and silt fences will be applied as warranted to ensure sediment and erosion control. The post-excavation monitoring will reduce the potential for sediment transport to nearby watercourses and will ensure the conditions will be stable

in the long term. An updated Quarry Pit and Borrow Management Plan was submitted on March 6 to QIA and on March 11 to the NWB for review and approval. An updated Quarry Management Plan and Blasting Operations Management Plan for Quarry Q1 at Milne Inlet was also provided as part of these submissions.

Quarry Q1 located at Milne Port – Site specific Quarry Management Plans submitted in the FEIS (Volume3, Appendix 3B, Attachment 6: Operation and Management Plan Milne Port Quarry) were updated and submitted to the QIA and NWB in early March.

Quarry QMR2 located at the Mine Site - a site specific Quarry Management Plan was provided in the FEIS (Volume3, Appendix 3B, Attachment 6: Operation and Management Plan Mary River Mine Site Quarry). This plan is in the process of being updated.

In addition, borrows will be developed at existing locations that are permitted by QIA under the existing commercial lease and by AAANDC under quarry and land use permits.

Operation of the Milne Port Quarry (Q1) and the Mary River Mine Site Quarry (QMR2) will be monitored to ensure compliance with the Borrow Pit and Quarry Management Plan and to meet the terms and conditions of the regulations and land-use permits granted for the Project. Monitoring will focus on:

- Regular inspection of site-preparation measures;
- Regular inspection of drainage from the quarry site;
- Quantification and quality estimates of the granular resource material;
- Monitoring for ground-ice presence;
- Monitoring for presence of avian, terrestrial and marine mammals in the area;
- Monitoring of water quality for changes;
- Monitoring of snow surrounding quarries for dust deposition; and,
- Reporting requirements as outlined in any permits.

Table 3.2 provides a summary of the monitoring and inspection requirements and Table 4.2 provides a summary of the monitoring locations and parameters.

4.3.6 Polishing/Waste Storage Ponds (PWSPs) and Fuel Storage Facilities

Engineered PWSPs have been installed at the Milne Port and Mine Site for the storage of effluent from the mechanical sewage treatment facilities. Treated effluent is stored under a range of potential circumstances: during periods of plant start-up; when there is inconsistent performance and exceedance of Water Licence discharge criteria; during periods of plant maintenance, and to provide a higher level of conservatism to discharge activities. Storage ponds will be inspected annually by a registered geotechnical engineer licenced in Nunavut and a report submitted to the Nunavut Water Board in accordance with Part D, Item 22 of the water license. Part of the site preparation work at Milne Inlet involves construction of a new PWSP that will used for construction start-up activities, once the Type A Water Licence is issued.

Bulk fuel is stored within engineered and lined containment areas at the Mine Site and Milne Port. Barrelled fuel caches and hazardous wastes are also stored within lined areas at various project sites. Inspections of fuel and waste storage areas will be completed in accordance with the EPP, including an annual inspection by a registered geotechnical engineer and a report submitted to the Nunavut Water Board in accordance with Part D, Item 22 of the water license for the bulk fuel storage areas.

4.3.7 Laydown Areas and Camp Facility Pads

For the early works construction phase, several laydown areas and camp facility pads will be constructed at Milne Port and the Mine Site, to enable storage of equipment and material required for the construction of the facilities. The EPP (Appendix 10B) provides procedures and guidance for the preparation of laydown areas and Appendix A and B of this plan provide drawings that refer to the site layouts and drainage plans.

Contouring, berms and silt fences will be applied as necessary for sediment and erosion control. Sediment and erosion control measures will be required and will be installed and the site will be regularly monitored as described in Tables 3.2 and 4.2.

4.4 TERRESTRIAL WILDLIFE

Potential impacts to wildlife could arise during operation of the Mine Site, Milne Port, Mid-Rail or Steensby Port, from air traffic and drilling activity (exploration and geotechnical programs), and from use of the Milne Inlet Tote Road, and at the port facilities. General impacts that could potentially affect a wide range of species can be organized into the following six main categories:

a) Impacts directly related to the Milne Inlet Tote Road
b) Disturbance
c) Habitat loss
d) Attraction and habituation
e) Hunting (mortality sinks)
f) Bioaccumulation of heavy metals and other pollutants in forage plants

The ESD identified a number of changes in project design, operational safeguards, and contingency plans to be applied to mitigate potential impacts. Highlights of the potential impacts and proposed mitigation include:

- Limit potential impacts to wildlife by limiting noise emissions to the extent possible. All mobile equipment used during the project is to be properly equipped with appropriate mufflers, to minimize noise.
- Minimize project footprint, thus minimizing the loss of habitat and reduction of habitat effectiveness. Habitat effectiveness decreases when wildlife use of a previously important habitat declines not because of habitat loss but because of disturbance.
- Adhere to the intent and spirit of both the traffic management plan and the caribou protection measures outlined in the North Baffin Regional Land Use Plan. This will minimize direct mortalities due to collisions with vehicles, and disruption of wildlife movements across the road. The Traffic Management Plan is included in the EPP.
- Minimize attractants at camps through responsible waste management and effective environmental awareness programs;
- Minimize and eliminate contamination of habitat by industrial products, and
- Address the potential for human interactions with polar bears through the development and implementation of a Human-Polar Bear Conflict Management Plan (refer to Safety Program Guidelines).

The EPP provides further details on work procedures intended to mitigate potential wildlife related impacts. In addition, the Wildlife Mitigation and Monitoring Program specifically developed for the geotechnical drilling program (as amended from time to time) will be followed. The Wildlife Mitigation and Monitoring Program was

developed as a condition of the ESD and is intended to detail potential wildlife impacts, propose mitigation strategies, and to establish a monitoring program specific to the geotechnical drilling program.

Wildlife monitoring was conducted in 2008 and in previous years as part of the on-going environmental baseline studies as well as specific activity monitoring associated with the exploration, geotechnical and bulk sample programs. Future baseline programs will be undertaken in accordance with approved plans and scientific research permits. The CEMP addresses only the monitoring to be undertaken in association with field activities including camp operation, air traffic, drilling activities, and port operations.

4.4.1 Regional caribou and bird surveys

Caribou have been observed in low numbers and densities in areas of project activity. These observations have been substantiated by through IQ studies, aerial surveys, ground surveys, and habitat assessment plots. Key surveys for caribou have been conducted in past years though aerial surveys to determine late winter distribution (March), calving surveys (mid-June), fall distribution (September and October), and trail surveys (summer). This monitoring has been conducted specifically in support of the bulk sample program and for the collection of information required for full-scale project planning. Continued regional monitoring as described above is not required at this point in time.

Since 2008, Baffinland has provided cash and/or in-kind support to the Government of Nunavut (GN) for initiation of the "Caribou Collaring and Data Acquisition Program" for the North Baffin Region. The field collaring program was successfully completed in early 2009. The caribou survey covered approximately 80,000 km sq. and extended from the very north tip of the Borden Peninsula to the southern coast of Baffin Island by Steensby Port. Caribou occurred at low densities throughout the study area including the Mine Site. A total of 30 GPS collars that were deployed in 2009 were retrieved in 2011. There were no injuries or mortalities during the collaring process. The information the collars collected on caribou movement and space will be useful for managing future land use activities, with the goal of minimizing impacts to both caribou and their habitat.

Also, terrestrial wildlife studies conducted in 2012 included ground and helicopter surveys of 309 of 311 raptor nest sites from south of Steensby Port area to the Milne Port from June to late August to document occupancy and productivity. Intervening habitat thought to be capable of harbouring breeding raptors was also searched resulting in the discovery of 29 new breeding sites. This represents more than a 3-fold increase in the monitoring effort over that conducted in 2006, and was more than 10-fold greater than survey effort in 2007. Of the 309 raptor sites surveyed, 61% were occupied. The raptor species observed included Peregrine Falcons, Gyr Falcons, Rough-legged Hawks. Regional occupancy rates observed in 2011 and 2012 for the Project are very similar to those found in other areas of Nunavut where long-term data are available. Nests located around the Steensby Port area were once again monitored more intensively. Snowy Owls were absent in 2012, most likely associated with low lemming abundance. Biologists banded nestlings and adults across all 3 species and deployed geolocators on adult Peregrine Falcons.

Lichen and soil samples were collected from approximately 40 sites both near project infrastructure (near site) and at distances up to 40 km from project infrastructure (far site controls). Those samples were collected to enhance the baseline assessment of metals in lichen (caribou forage) and soils.

Landbird surveys were conducted using Environment Canada's PRISM plot survey methods. PRISM plots are 300x400 metre plots used to assess breeding arctic shorebird and songbird densities. About 70 PRISM plots were surveyed near site and far site from late June to early July by two crews of three members each. Each crew had one ornithologist, a co-op student, and Inuit observer. Although an analysis is on-going, species included the expected mix of eastern arctic birds. Densities are expected to be very low based on limited

observations of birds in these plots relative to PRISM surveys conducted in other areas of Nunavut by Baffinland's terrestrial biologists at EDI Environmental Dynamics Inc.

Shoreline surveys for nesting birds were conducted in Steensby Port to address Environment Canada's concerns of ship wake effects on shoreline nesting birds. One-hundred and three (103) kilometres of shoreline surveys were conducted on the "mainland" portion of Baffin Island from late June to early July. The shorelines surveyed included those near the proposed port site, those expected to experience wake effects, and control shorelines that will not experience wake effects. Steensby Port was ~100% ice covered during the survey. Nests closest to the shore included semi-palmated plover, snow bunting and American Pipit. Those nests would have fledged chicks before ice break-up, indicating that wake effects would be negligible in many areas along the shore. Surveys may have been too early to detect nesting eiders as pairs were frequently observed in open water portions of the shoreline near mouths of rivers, implying that nesting had yet to begin. Shoreline surveys of near shore islands were not conducted due to aircraft safety protocol.

4.4.2 Drill Monitoring

Wildlife surveys and observations of the area around geotechnical drill sites prior to drill placement, during and following drilling operations, by completing pre-drilling and post-drilling checklists in accordance with the EPP.

4.4.3 Incidental Wildlife Observations

A wildlife log is maintained at each of the camps and will be used by all site personnel for the incidental reporting of wildlife observations while working at camps as well as during remote work or travelling by vehicle or air. The Environmental Health and Safety Superintendent will ensure the use of the wildlife log by personnel as per the EPP.

4.4.4 Visitors Log

A visitors log is maintained to document observed visitors and hunters in the area of project activities, including the use of the Milne Inlet Tote Road. The Environmental Health and Safety Superintendent will ensure the use of the visitors log by personnel as per the EPP.

4.4.5 Constraints Mapping

Information gathered through surveys and logs have been incorporated into constraints maps that are updated, as required, and used as an operational tool to assist in avoiding or minimizing disturbance to terrestrial wildlife.

4.5 FISHERIES AND AQUATIC RESOURCES

Potential sources of project related impacts to fish and fish habitat include the release of sediment to water courses affecting water quality, alteration of fish habitat or blockage of fish passage, accidental release of deleterious substances (i.e., fuel spills) or the potential entrainment of fish through water supply intakes for drilling and potable water.

4.5.1 General Mitigation and Monitoring

In general, construction and operational activities will be undertaken a minimum of 30 metres away from water bodies to minimize the potential for release of sediment and deleterious substances that may affect fish or fish

habitat. Constraint maps will be maintained by the Environmental Health and Safety Superintendent to identify areas assessed as fish habitat.

The potential for fuel spills in and around water will be addressed by the refuelling of equipment at a distance greater than 30 m from any water bodies, as specified in land use approvals and wherever possible. Fuel will be managed and monitored in accordance with the EPP and related operating protocols.

4.5.2 Milne Inlet Tote Road

Upgrade to the existing Milne Inlet Tote Road to facilitate all-season use required the installation and/or replacement of culverts at water crossings and key drainages along its approximate 104 km length. Work was initiated in 2007 and largely completed in 2008.

Twenty-five (25) of the culvert installations along the Tote Road were expected to likely result in a Harmful Alteration, Disruption or Destruction (HADD) of fish habitat as defined under the *Fisheries Act*. Under the terms of the Section 35(2) Fisheries Authorization issued by DFO for these installations, a Fish Habitat No Net Loss and Monitoring Plan (No Net Loss Plan) was developed to mitigate impacts to the associated fish habitat. As an element of the No Net Loss Plan, enhancement and/or restoration of fish habitat was planned at thirteen (13) locations along the Tote Road. An additional twenty-four (24) watercourses containing fish habitat identified along the length of the Milne Inlet Tote Road were deemed not to likely result in a HADD. A letter of advice was issued by DFO for the installation of these crossings. Table 4.1 provides a summary of culvert installations.

The monitoring aspects of the No Net Loss Plan were developed to ensure that all measures and works specified in the Plan and the fisheries authorization have been implemented and are functioning as intended. This Monitoring Plan is being implemented at the 25 HADD authorized crossings and the 13 compensation sites, unless indicated otherwise below. The monitoring plan is to be implemented annually a minimum of two years post-construction or until the No Net Loss Plan has been successfully implemented.

The Fisheries Authorization requires an annual report to be submitted at the end of each calendar year. The annual report includes a description of any construction work, fish habitat assessments, and fish habitat compensation works undertaken over the year, as well as turbidity monitoring data and a photographic record of the work. Much of the work required under the Fisheries Authorization was completed in 2008, with three crossings identified as No Net Loss Compensation Sites completed in 2009. Despite, the completion in 2009 of the construction measures required in the Fish Habitat Compensation Plan, there still remains a shortfall of habitat gain to compensate for HADD. This was largely due to the fact that many of the existing compensation sites were identified as non-fish bearing during 2009 studies. During 2010, 2011, and 2012, actions were taken to address this concern.

During 2009, major repair work was required at box culvert CV-217 located at km 80 due to damage sustained during freshet flows. During fish and fish habitat surveys of crossings in the late spring and summer, four round culverts (were identified as partial or complete barriers to upstream movements of fish. Work plans were established to repair these crossings by means of downstream habitat enhancement construction. This work was partially completed during late 2009 and early 2010. Amendments to the HADD authorization and a letter of advice provided approval for the work to proceed.

On-going monitoring, maintenance and upgrades of the Tote Road and bulk sample pit haul road, including grading and contouring of borrow areas will be undertaken as warranted to further reduce the risks for substantial sediment and erosion and to enhance safety along the road.

4.5.3 Construction Monitoring

During in-water construction of all Medium, Large and Extra-Large crossings ranked as fish habitat and all compensation and reclamation sites, a designated environmental inspector will be on site to ensure implementation of the designs as intended in the Plan and conditions of the authorization. A Watercourse Crossing Monitoring Data Form, included in the EPP has been prepared to be completed by the environmental inspector just prior to, during and immediately post construction.

Information to be collected and items to be monitored at each location, and recorded on the Watercourse Crossing Monitoring Data Form, includes:

a) Construction dates
b) Location
c) Fish and fish habitat assessment
d) Channel characteristics pre and post construction, upstream and downstream
e) Sediment and erosion control measures
f) Crossing installation details
g) Record of the photographs

For in-water work within the restricted timing window from September 1 to June 30, the Extra-Large, Large and Medium crossings with fish habitat will be assessed on-site by the designated environmental inspector prior to the onset of construction to confirm the absence or presence of potential spawning sites situated within 20 m either upstream or downstream of the crossing location, and whether spawning Arctic char are present in the vicinity.

During construction of HADD authorized crossings with flow, turbidity will be monitored downstream of the crossings where possible. Details of this monitoring are outlined in the sub-section below.

Crossings will be visually inspected immediately after construction to confirm that the culverts are functioning as intended and that fish access has been maintained or enhanced. Positive and/or negative effects will be documented.

In addition to the measures outlined above, there is the possibility of field adjustments to the exact location of any of the crossings within the watercourse. In these cases, a habitat assessment will be completed to confirm that impacts to habitat remain materially the same before proceeding.

4.5.4 Post Construction Monitoring

Medium, Large and Extra-Large crossings ranked as fish habitat and compensation and reclamation sites will be monitored post construction to ensure that all measures and works specified in the Plan and the fisheries authorization have been implemented and are functioning as intended.

Flow will be monitored to ensure that the installation of crossing structures has not adversely affected upstream and downstream fish migration. Flow was measured during the spring runoff period and after extreme storm events, in 2008 and 2009, at the four Extra-Large crossings to determine if flows exceed the ability of adult char swimming. Flow depth was measured at all 25 HADD authorized crossings during the low flow period in August to ensure fish passage is possible through the embedded culvert.

Fish habitat compensation works will be monitored to ensure that the works are functioning as intended. Fish passage and habitat conditions will be assessed at the compensation sites, where relevant, post-construction through observation and fish trapping.

Compensation sites, where restoring fish access to upstream habitat was the goal, were inspected upstream and downstream to identify barriers to fish migration. Electrofishing was conducted within the fish accessible reach to document fish presence during the first full open water season post-construction.

Habitat reclamation sites were visually inspected post-construction to ensure that stream substrate below the debris removal spots is consistent with the rest of the stream. If not, the situation was assessed and rehabilitation measures, such as moving larger rocks to the area, were undertaken where appropriate. Electrofishing was conducted within the fish accessible reaches to document fish presence during the first full open water season post-construction, as appropriate.

Habitat enhancement sites were monitored to ensure that sediment inputs to the downstream environment have been reduced. Turbidity was monitored pre and post rainfall events downstream of BG016 and CV176. Turbidity was monitored approximately two weeks after construction, where possible, as outlined in the subsection below.

4.5.5 Turbidity Monitoring

Turbidity has been shown to affect fish habitat. Suspended solids in turbid water can clog fish gills, reduce growth rates, decrease resistance to disease, and prevent egg and larval development. Settled particles can smother eggs of fish and aquatic insects.

During road construction, on-site visual monitoring of turbidity was conducted and used to ensure that various mitigation measures are implemented, including:

a) Minimizing timing of in-water work
b) Limiting fording to one-time, where possible
c) Implementing and maintaining effective sediment and erosion control measures
d) Delaying work if it is visibly apparent that char are migrating through the particular crossing

To document site conditions during and after construction and decommissioning, turbidity was monitored in watercourses with fish habitat both upstream and downstream of construction activities where possible. The upstream reading provided background turbidity information for the watercourse, while the downstream reading provided information on changes in turbidity caused by construction. Upstream readings were collected well away from any construction activity (approx. 50 m) to provide accurate results. Depending on activities and site conditions, readings may be collected at more than one location upstream and downstream. At each monitored watercourse crossing, a Turbidity Monitoring Data Form, included in the EPP, was completed to document conditions and record turbidity readings

Turbidity was measured during construction, as well as approximately 2 weeks after construction activity was completed at each monitored watercourse crossing. In comparing background data with post-construction data, factors affecting turbidity, such as weather conditions and stream flow, were considered. Turbidity measured post construction was compared with upstream turbidity measured during construction.

4.5.6 Ice Blockage Monitoring and Contingency Plan

Following any crossing construction and during road use, the amount of ice build-up in front of the culverts will be monitored and ice will be removed if necessary. Ice will be removed manually or using steamers or other devices.

4.5.7 Water Intake and Sewage Outfalls

The potential for entrainment of fish through water supply intakes (camps and drills) will be addressed through adherence to the Department of Fisheries and Oceans guideline entitled "Freshwater Intake End-of-Pipe Fish Screen Guideline" (DFO, 1995).

Water sources for drilling will be selected in consideration of the potential for drawdown. Streams will not be used unless previously approved by the Nunavut Water Board and rivers/lakes will not be selected for use should there be risk of drawdown elevation exceeding 5%. Water sources proposed for use will be reported as per the water license, and at least ten (10) days in advance of use. During use, water sources will be periodically be monitored for drawdown and documented on drill inspection forms in the EPP. Drilling will be suspended if drawdown limits are exceeded.

Water intakes will be installed and operated in accordance with the DFO Letter of Advice and the Transport Canada Navigable Waters Section 5(2) approvals applicable to these activities.

4.6 MARINE WILDLIFE

The following project components have been identified through which the Project could potentially have an impact on marine mammals:

a) Underwater and airborne noise due to construction-related activities and from the operation of ships and barges
b) Human interactions with wildlife
c) Accidental introduction of hydrocarbons or other deleterious substances into the marine environment

In support of the shipment of a bulk sample, a marine mammal monitoring program within the Pond Inlet-Eclipse Sound-Milne Inlet area of Nunavut was conducted by aerial line transact surveys during the open water season of 2008. The objectives were to document the distribution and response of marine mammals in the area to ship traffic to and from the landing site at Milne Port and to assist in the environmental assessment of the Mary River Project. The 2008 monitoring program was guided by the results of the 2007 program. Also in 2008, a similar aerial survey was undertaken in association with the dry cargo sea-lift that landed at the Steensby Port.

Observed reactions of marine mammals have been generally consistent with other studies documented in the literature. Large changes in the geographic distribution of marine mammals that could be attributed to vessel transit were not observed. Minor and localized behavioural reactions of narwhals to the ship transits en route to or from Milne Port were observed and characterized by increased swimming speed and some alteration to swimming direction by narwhals in close proximity to the vessel or vessel track.

A dedicated marine monitoring program is not required to support on-going sea-lift operations at Milne Port and Steensby Port in association with current project activities. Mitigating measures outlined in the EPP will continue be followed to reduce the potential for impacts to marine mammals.

4.7 WATER QUALITY

The objectives of the water monitoring programs are to:

a) Ensure water use is not exceeding quantity restrictions and is being extracted from approved locations without causing adverse effects
b) Ensure sewage treatment facilities are meeting effluent quality requirements and that receiving waters are not being negatively impacted
c) Ensure that site drainage and runoff are not being adversely affected by site activities

Water quality monitoring is described below. This section incorporates water license requirements as well as aspects of the ESD, the Surface Water and Aquatic Ecosystems Management Plan and the Wastewater Management Plan. The latter documents are requirements of the water license and outline the management approaches as well as monitoring that is consistent with the CEMP.

The water quality monitoring program consists of several elements as follows:

a) Measurement, recording and reporting of water volumes extracted, as prescribed by the water license
b) Sampling, analysis and reporting of water quality, as prescribed by the water license
c) Weekly to monthly monitoring downstream of exploration drilling and construction activities during periods of open water

Table 4.2 summarizes the water quality monitoring program. This monitoring program is carried out concurrent with on-going baseline water quality sampling; however, the baseline program is not discussed in the CEMP.

The QA/QC Plan for water quality monitoring, originally included as part of the Surface Water Management Plan is now presented in Appendix C of this document.

4.7.1 Potable Water

Potable water treatment systems are in place for the Mine Site (drawing water from Camp Lake), for the Milne Port (drawing water from Phillips Creek in summer and an un-named lake at km 32 of the Milne Inlet Tote Road in winter), and for the Mid-Rail Camp (drawing water from the adjacent lake). Potable water for Steensby Port is either pumped directly using drill hose from an un-named lake approximately 3 km east of the camp or transported to camp in buckets via helicopter. . Potable water treatment systems for the four camps consisted of holding tanks, UV disinfection, and filtration. There are two main regulatory instruments related to potable water use: Baffinland's water license and the *Public Health Act* and associated regulations.

The water license requires reporting of daily water use, using flow meters as appropriate, for all active camp water taking locations, as described in Table 4.2. Daily water use is to be reported in monthly reports to the NWB. The total allowable daily water use for camp water supply is 60 m^3.

4.7.2 Drill Water

The water license requires reporting of daily water use, using flow meters as appropriate for all exploration and geotechnical drilling water taking locations, as described in Table 4.2. Daily water use is to be reported in monthly reports to the NWB. The total allowable daily water use for drill water supply is 325 m^3. There is no

water quality monitoring required under the water licence for drill water use, with the exception of on-ice drilling, as discussed further below.

An exploration drill water quality monitoring program has been undertaken since 2005 at selected locations upstream (reference), downstream along the Mary River (potentially affected), and along steep seasonal flow channels that drain the rugged topographic terrain that characterizes the land surface in the vicinity of Deposits 1,2 and 3. The main objective of the monitoring program is to identify and measure Contaminants of Potential Concern (COPCs) in Mary River, both upstream at locations unaffected by drilling activities, and downstream at locations that may be potentially affected by drilling activities. Each year, the water quality monitoring program is dependent and specific to the planned scope of the drill program. The Environmental Health and Safety Superintendent will, in consultation with Operations personnel, design the annual exploration drill water quality monitoring program and ensure that it is implemented. The results of the monitoring program will be used to guide adaptive management measures, as appropriate.

4.7.3 Sewage Treatment Plant Effluent

Baffinland's water license specifies requirements to measure and report on a monthly basis both the flow (volume) of sewage effluent discharged as well as final effluent quality, to confirm that effluent quality meets the requirements of the Water License, and is acceptable for release into Sheardown Lake or the drainage ditch at Milne Port, as appropriate.

a) Quantity of sewage treated (continuous)
b) Quantity of sludge generated (tabulated)
c) Monthly testing of final effluent quality discharged from the WWTFs, as follows:
    - BOD_5 (biological oxygen demand)
    - Total suspended solids (TSS)
    - Faecal coliform
    - pH
    - Visible sheen (total oil and grease).

In addition, Baffinland conducts the following additional monitoring, not required by the water license:

- Monthly testing of sewage influent for the following parameters:
    - BOD_5 (biological oxygen demand)
    - Total suspended solids (TSS)
    - Faecal coliform
    - pH
    - Total Kjeldahl Nitrogen (TKN) plus ammonia-nitrogen
    - Total phosphorus (Mine Site only)

- Monthly testing of final sewage effluent for the following additional parameters not required by the water license:
    - TKN plus ammonia-nitrogen
    - Total phosphorus
    - COD (chemical oxygen demand)

- Under ice and open water testing (on Sheardown Lake of receiving water quality for the following additional parameters not required by the water license:

- BOD5 (biological oxygen demand)
- Total suspended solids (TSS)
- Faecal coliform
- pH
- Total Kjeldahl Nitrogen (TKN) plus ammonia-nitrogen
- Total phosphorus
- Dissolved Oxygen (during both open water and ice cover)

Monitoring of effluent and receiving water quality is outlined in detail in Table 4.2. Data required under the Water Licence will be reported on a monthly basis, and is discussed further in Section 14.

4.7.4 Bulk Fuel Storage Facilities

Precipitation will collect in the fuel tank farm containment area. The water license specifies the collection and testing of berm water prior to discharge, at the Mine Site bulk fuel storage facility (MRY-6) and the Milne Port bulk fuel storage facilities (MRY-7 & 7a). Sampling should be conducted as outlined in Table 4.2.

4.7.5 General Site Drainage and Stormwater

A number of water quality monitoring stations were established throughout the Project area to collect baseline water quality. Many of the sampling sites are within local creeks or drainages both upstream and downstream of drilling, mining, crushing, stockpiling and fuel storage locations. Current water quality sampling stations at the Mine Site and Milne Port and along the Milne Inlet Tote Road are shown on Figures 1.2, 4.1 and 4.2.

Additional water quality monitoring stations will be established to provide monitoring of the site preparation construction works and quarrying activities, laydown areas and camp pads at Milne Port (8 locations) and the Mine Site (6 locations). These stations are detailed in Table 4.2 and in Appendix B. The recommended sampling parameters and schedule of analyses are provided in Table 4.2.

Several stations are sampled on a weekly basis up and downstream of exploration drilling, while most sites are sampled on a monthly basis during periods of flow. Annual water sampling stations will be contingent on the field programs, while maintaining continuity in the database.

Runoff monitoring locations in relation to the bulk sample pit and ore stockpiles, as required by the water license, is discussed on the following section.

4.7.6 Runoff from Bulk Sample Pit, Ore Stockpiles, and Landfill

Baseline data collection continues on the characterization of waste rock and ore that would be generated during full-scale mining for acid generation (acid rock generation – ARD) or metal leaching (ML). The ESD predicted that the risk for ARD and ML associated with the bulk sample program was low, and this was confirmed through follow-up testing in 2008 of the materials actually generated. Monitoring of the bulk sample pit and residual ore stockpiles at the crusher location and Milne Port will continue in accordance with the requirements of the water license and to confirm that poor quality run-off is not being generated through ARD or ML.

Several stations are specified in the water license: MRY-9 will collect seepage from the mixed ore (hematite and magnetite) bulk sample pit. MRY-10 is seepage collection at the weathered ore stockpile; MRY-11 and MRY-12 is seepage collection from the ore stockpiles at the Mine Site crusher location and Milne Port,

respectively; and MRY-13 is surface flow / seepage collection downstream of landfill. Sampling parameters include the following:

a) Field parameters (pH and total suspended solids)
b) Metals, including arsenic, copper, lead, nickel and zinc
c) Oil and grease

Parameters required for reporting by the water license are identified in Table 4.2.

4.8 HYDROLOGY

Seasonal hydrometric stations have been installed and operated in various locations from 2006 to 2008, and again in 2010, 2011, and 2012 to characterise the hydrologic regime (timing and magnitude of flows) in the Mary River Project area. These seasonal stations are removed from the watercourses in mid-September as the rivers freeze and are re-installed in late May or early June as the rivers begin to flow. In addition, Water Survey of Canada (WSC) has been contracted since 2006 to operate year-round hydrometric stations on four large rivers within the region (Mary River, Ravn River, Rowley River and Isortoq River). This work will likely continue during 2013.

Assembled hydrology data has provided the basis for engineering design and environmental assessment of water related aspects of the proposed Mary River Project. During 2011, the Water Survey of Canada (WSC), under contract to Baffinland, continued to operate hydrometric stations on four large rivers within the region (Mary River, Ravn River, Rowley River and Isortoq River).

4.9 WASTE MANAGEMENT

4.9.1 Waste Management Plan

Combustible non-hazardous solid waste will be incinerated in manufactured high efficiency diesel-fired incinerator at both the Mine Site and Milne Port. The incinerators have double burners and will burn circulated exhaust. Incinerators will be operated in accordance with manufacturers' guidance and reflected in the EPP and associated site specific procedures.

Non-hazardous bulky inert wastes, such as steel, plastics and rubber are disposed of in the inert landfill. Empty drums will be shipped back to the vendor; damaged ones will be crushed and sent off-site for recycling. Disposal of hazardous wastes, including waste oil, is discussed below.

The inert landfill was constructed in 2010 (landfill construction was deferred in 2009), as approved by the Nunavut Water Board, and used for disposal of non-combustible, non-hazardous, bulky waste with little to no salvage value. The landfill is considered "inert" because no biodegradable or hazardous wastes are placed in the landfill – only steel, plastics, glass and rubber that has been cleaned of either oily residues or food wastes – so that the wastes do not attract animals and do not generate toxic leachate. Ash residue from the incinerators will also be placed in the landfill subject to analytical testing. Existing bulky wastes from the 1960s as well as equipment and materials associated with recent project activities, was screened for non-compatible contents and placed into the new landfill. The operation and monitoring of the landfill is in accordance with the approved operations and monitoring manual.

During 2011 and continuing to the present, major efforts were undertaken to review and improve waste management practices. Waste management documentation was redeveloped for the Project and strategies involving handling, storage, transportation, and disposal of waste generated by Project activities were reviewed and revised/enhanced as appropriate. A three-day waste audit at the Mine Site focused on incinerated non-hazardous camp wastes was undertaken.

The three day waste audit was conducted in August and the results of the audit indicate that the average waste generation rate per person is 1.61 kg/day, slightly higher than typical Canadian residential rates, but relatively lower than expected for a typical mining camp. The distribution of the main waste components shows a similar pattern to other remote locations, but bears differences also that may influence incinerator operation. These differences include: lower content of inert waste, higher content of paper products and of plastic and marked differences in waste content among workplaces. These conditions may result in higher than wanted incinerator waste load heating values. The main recommendations to come from this study are to standardize waste loads, to revise the incinerator procedure to include a standardized incinerator operation log (that demonstrates appropriate operations), and to reduce paper and plastic content from the waste composition.

4.9.2 Hazardous Waste Management

Hazardous wastes associated with the project include oils, greases, antifreeze, lead acid batteries, and cleaners. Waste materials (used oil, antifreeze) will be collected in suitable containers, labelled as waste, and stored within lined containment areas until removed from site.

4.9.3 Waste Monitoring

Waste monitoring includes the visual inspection of three main components of the waste management system (described below) and the measurement and recording of all wastes taken off site. Part I, Item 16 of the water license requires the following to be reported on a monthly basis:

a) The quantities in cubic meters of domestic waste, sewage and hazardous waste hauled off-site for disposal
b) The location and name of the disposal facility for each waste type
c) The date that each was hauled off-site for disposal, for each occasion that these are removed from the site

Prior to the availability of an on-site landfill, inert wastes were temporarily stored in designated locations at the Mine Site and Milne Port and in a manner that minimized the opportunity for wind-blown debris and animal attraction. Any wastes that are shipped off site will be recorded using an Off-Site Waste Disposal Log or equivalent developed through the EPP.

Hazardous wastes must be manifested in accordance with the Transportation of Dangerous Goods Regulations. Copies of the manifests will be forwarded to the Environmental Health and Safety Superintendent for inclusion in the monthly report to the Nunavut Water Board.

Regular visual inspection of waste management facilities will be conducted by the Environmental Health and Safety Superintendent, to ensure proper operation and adequate environmental controls are in place.

Monitoring of the incinerator operation involves ensuring proper operation and that appropriate wastes are incinerated.

Monitoring of the inert landfill involves visual inspections to ensure that only inert wastes are deposited in the landfill, and that adequate cover is provided so that wastes are contained and are not being dispersed by the

wind. The Waste Disposal Facility (Landfill) Inspection Form is included in the EPP. Temporary storage locations for landfillable waste will be monitored for suitability of materials.

Hazardous materials storage areas will be inspected on a regular basis to ensure:

a) Proper storage (including proper labelling) and containment
b) Evidence of accidental releases, or ongoing leaks, drips or other indications of loss
c) Identification of cracks, corrosion, or damage to tanks, protective equipment, or floors
d) Conducting periodic inspections of waste storage areas and documenting the findings
e) Preparing and implementing spill response and emergency plans, if required

4.10 OPERATIONS MONITORING

In addition to specific monitoring and reporting requirements under the regulatory approvals such as the water license, QIA land lease, land use permits, and fisheries authorization as well as monitoring of project effects associated with execution of the bulk sample program, the Environmental Manager or his designate will coordinate routine inspections of various aspects of the operations. Routine inspections are conducted to confirm overall conformance with the requirements of the CEMP and companion EPP and will include inspections of all site based activities including exploration and geotechnical drilling, environmental baseline and related studies, camp operations, and bulk sample related activities.

The EPP includes a copy of the Compliance Monitoring Form used to document the findings and required actions. These reports are generated as an internal operational management tool to promote continuous improvement in environmental stewardship.

Checklists are used on a hole by hole basis for the exploration and geotechnical drill program as internal operational monitoring and compliance tools. These checklists are integrated into the EPP.

4.11 SOCIO-ECONOMICS

4.11.1 Archaeological Resources

Archaeologists will be retained for the Project, as necessary, and will be on site conducting surveys in advance of work being undertaken in areas not previously assessed for archaeological resources. Work will not be undertaken in an area without archaeological consultation.

Compliance with the provisions of the Territorial Land Use Regulations and the Territorial Lands Act will be enforced as part of the CEMP. Known or suspected archaeological features will be avoided by applying a 30 m buffer, unless otherwise approved, and work will be stopped if archaeological resources are identified.

An operational standard providing guidance to site personnel to ensure that archaeological resources are not impacted during site operations is provided in the companion EPP.

4.11.2 Employment and Training

The current Project provides an ongoing opportunity to collect and organize information on employment, such as an inventory of skills and abilities, and the duration of employment of the workforce (i.e., short term versus for

the duration of the program). This information will assist Baffinland and its consultants in understanding the "workforce ecology" of the participating communities in the region, provide a basic employee database, and enhance human resource strategies for a future full-scale mining operation. Records of successful completion of training will also be retained.

SECTION 5.0 - DATA MANAGEMENT AND REPORTING

5.1 DOCUMENTATION AND DATA CONTROL

The Environmental Manager will coordinate the preparation, review and distribution, as appropriate, of the data and reports required for regulatory purposes. Various management plans and other regulatory deliverables will also be coordinated by the Environmental Manager.

Execution of some of the monitoring programs detailed in the CEMP and associated plans will be conducted by, or supported by consultants and contractors to Baffinland. Data and reports will be prepared and delivered to Baffinland by its consultants for internal and external distribution and use, as appropriate.

All formalized documents and reports will follow data control procedures, with revision numbers and revision tracking. Documents and data that are to be issued and liable to change will be controlled to ensure that they are approved before issue and that the current issue or revision is known to and available to those requiring them.

5.2 EXTERNAL REPORTING

Implementation of the monitoring under the CEMP results in the collection of data and the generation of various reports. Whereas there are regulatory requirements for formal monthly and annual reports including disclosure of issues of non-conformance, internal reporting is used to provide direction to personnel and to provide operational updates to site and corporate management. Internal reporting mechanisms may include weekly environment reports, weekly operations reports, and routine inspection reports. Site based toolbox and management meetings are also an important internal reporting tool commonly used.

External reports will be prepared as follows:

5.2.1 Monthly Reporting

The water license requires reporting on a monthly basis, for the preceding month by the end of the following month (i.e., the August monthly report is due by September 30). Table 4.2 outlines the reporting requirements. Not all monitoring is to be reported as per the water license; some components of the monitoring program are for Baffinland's information only.

5.2.2 Annual Reporting

There are five instruments requiring reporting on an annual basis. The first two are the NIRB Screening Decisions for the Exploration and Geotechnical Drilling, and the Bulk Sampling Program, respectively. The contents of the annual report are summarized below.

NIRB Screening Decision dated March 24, 2007 for the Exploration and Geotechnical Drilling Program - Project-specific Terms and Condition #4

The Proponent shall submit an annual report with copies provided to the NIRB, INAC, the QIA, and EC by January 31 each year that the project is in operation commencing January 31, 2008. The report must contain, but not be limited to, the following information:

a) A summary of activities undertaken for the year, including the amount of drilling;
b) A work plan for the following year;
c) The results of environmental studies undertaken and plans for future studies;
d) Wildlife encounters and actions/mitigation taken;
e) A summary of local hires and initiatives;
f) A summary of community consultations undertaken and the results;
g) A summary of site-visits by inspectors with results and follow-up actions;
h) The number of take-offs & landings from an airstrip with approved flight path with date and location;
i) The number of helicopter touch-downs on the land with date and location (provide unless confidential);
j) Site photos;
k) Progressive reclamation work undertaken; and
l) A summary of how the Proponent has complied with NIRB conditions contained within this Screening Decision and the conditions associated with all authorizations for the project proposal.

NIRB Screening Decision dated May 4, 2007 for the Bulk Sampling Program - Project-specific Terms and Condition #5

The Proponent shall submit an annual report with copies provided to the NIRB, INAC, the QIA, Environment Canada and Government of Nunavut by January 31 each year that the project is in operation commencing January 31, 2008. The report must contain, but not be limited to, the following information:

a) A summary of activities undertaken for the year, including any progressive reclamation work undertaken, and a work plan for the following year –site photos should be provided where relevant;
b) A summary of how the Proponent has complied with NIRB conditions contained within this Screening Decision.
c) A summary of the results from the Monitoring Program and the Construction Environmental Management Plan, including:
    i. An analysis of the impact of the project upon the bio-physical and socioeconomic environments, including the cumulative impacts from other activities within the project area;
    ii. An analysis of the effectiveness of mitigation measures;
    iii. The identification of any unanticipated environmental impacts (if any) and any follow-up required (if relevant);
    iv. Compliance status with applicable regulations and all authorizations associated with the project activities, including any exceedances of CCME-FWAL criteria (as reported to Environment Canada, the Nunavut Water Board, and the Department of Fisheries and Oceans Canada);
    v. Any necessary adaptive mitigation strategies employed;
    vi. Any modifications made to the Monitoring Program;
    vii. Results of community member involvement in the Monitoring Program; and
    viii. Description of the progress made on the development of component-specific thresholds used to determine the necessity for adaptive mitigation and management strategies.
d) A summary of community consultations undertaken and the results; and

e) A summary of site-visits by inspectors with results and follow-up actions.

NIRB Screening Decision dated February 22, 2008 for the Exploration and Geotechnical Drilling Program - Project-specific Terms and Condition #8

The Proponent shall include in its Annual Report for Geotechnical and Exploration Program all the proposing project activities and components described in this application. In addition to the requirements directed by NIRB in its Screening Decision Report dated March 26, 2007 for 07EN004, an accumulative effects assessment should be included in the Annual Report with respective to the additive and cumulative effects by the two subprojects and the proposed expansions of the one subproject (i.e., the geotechnical and exploration project) comprising the larger Mary River Project.

The requirements of the NIRB annual reports will be met with submission of a single report.

Water License Annual Report
Part B, Item 6

The Licensee shall file an Annual Report on the appurtenant undertaking with the Board no later than March 31st of the year following the calendar year being reported which shall contain the following information:

a) The monthly and annual volumes in cubic metres of all fresh water obtained from Camp Lake at Monitoring Station MRY-1, Phillips Creek at Monitoring Station MRY-2, km99 Lake at Monitoring Station MRY-3 and the additional sources of water identified for Camp use under Part C, Item 1;
b) The monthly and annual volumes in cubic metres of all freshwater obtained for the purpose of drilling and other associated uses;
c) the monthly and annual volume in cubic meters of treated Sewage effluent discharged at Monitoring Station MRY-4, Mary River Camp WWTF and at Monitoring Station MRY-5, Milne Port WWTF along with any waters discharged from the respective PWSP's;
d) the monthly and annual quantities in cubic metres of Sludge removed from the Waste Water Treatment Facilities at Mary River Camp and Milne Port and details on the storage and/or disposal;
e) A summary, including photographic records before, during and after construction activities; of any modifications and/or major maintenance work carried out on the Water Supply and the Wastewater Treatment Facilities, including all associated structures, and an outline of any work anticipated for the next year;
f) The geochemical analysis of drill cores as per Part F, Item 3;
g) Detailed discussion on the performance, installation, and evaluation, including the use of photographic record, of the primary and secondary containment functions used in fuel storage to safeguard impacts to freshwaters;
h) A list of unauthorized discharges and a summary of follow-up actions taken;
i) A brief description of follow-up action taken to address concerns presented within inspection and compliance reports prepared by the Inspector;
j) An update, where required under Part B, Item 11 in the form of an addendum or revisions to the Abandonment and Restoration Plan, Emergency Spill Response Plan, Site Water Management Plan, Waste Water Management Plan, Waste Rock and Ore Storage Plan, QA/QC, Landfill Operations and Maintenance Plan, and Landfarm Plan;
k) A description of all progressive and or final reclamation work undertaken, including drill sites, presented with photographic records of site conditions before, during and after completion of operations;

l) An updated estimate of the current restoration liability required under Part B, Item 2, based upon the results of progressive restoration, restoration research, project development monitoring, and any changes or modifications to the Project;

m) Tabular summaries of all data generated under the Monitoring Program, Part I;

n) A summary of public consultation/participation, describing consultation with local organizations and residents of the nearby communities, if any were conducted;

o) A summary of any specific studies or reports requested by the Board, and a brief description of any future studies planned or proposed; and

p) Any other details on water use or waste disposal requested by the Board by November 1 of the year being reported.

The **DFO authorization (NU-06-0084)** stipulates that a written report summarizing the above monitoring results shall be submitted to the Iqaluit, NU office of the Department of Fisheries and Oceans - Fish Habitat Management, Eastern Arctic Area on, or before, December 31 of each year, according to the schedule in section 5.2.

The **QIA Commercial Lease for Inuit Owned Lands (No. Q10C3001)** Clause 6.01 (g)

The Tenant hereby covenants with the Landlord that it shall, at its own cost and expense:
(g) deliver to the Landlord, on or before March 1, 2011, and not later than March 1st of each subsequent year of the Term, a report, in form and scope satisfactory to the Landlord in respect of all environmental issues arising in respect of the Tenant's Operations and Work on the Property for the past calendar year, which report shall include:

1) Information respecting the Tenant's compliance with the terms of this Lease and any permits or licenses required in respect of its Operations on the Property, together with details of any incidents of non-compliance, the results of any inspection reports prepared by or fines levied by any competent regulatory authority and any remedial action relating thereto;

2) copies of any environmental reports, or incident reports; or incident reports or documentation relating to project changes on environmental matters that the Tenant is required to submit to any competent regulatory authority;

3) copies of any environmental monitoring reports or environmental studies in respect of the Property prepared for the Tenant, together with any interpretation or analysis of the data contained therein done by the Tenant or its agents or consultants; and

4) a report on any Reclamation Work undertaken or required to be undertaken in accordance with this Lease.

The **QIA Commercial Lease for Inuit Owned Lands (No. Q10C3001)**: Schedule "D" Role, Responsibilities, and Authority of Environmental Inspector and Environmental Auditor - Liquidated Damages

17. If the Tenant contravenes any environmental obligation of this Lease, including failure to comply with the Environmental Terms and Conditions or any of the provisions of an Environmental Action Plan, or contravenes a direction or order issued by an Environmental Inspector or Environmental Auditor, the Tenant shall immediately notify the Landlord of such contravention in writing. The Tenant will then, within 15 days of such notification, present a plan to the Landlord to resolve the issue, such plan to be approved by the Landlord acting reasonably.