BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT

DEVELOPMENT PROPOSAL FOR THE MARY RIVER PROJECT

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EXECUTIVE SUMMARY (ENGLISH)

Introduction

The Mary River Project ("the Project") is a proposed iron ore mine and associated facilities located on North Baffin Island, in the Qikiqtani Region of Nunavut. Baffin Island is home to Inuit, who enjoy a culture that is unique and traditional to arctic regions. The land where the Project is located is important to Inuit culture, heritage, and their continued well-being in that these people use the resources on the land and from the sea for both their subsistence and in preserving their traditional way of life.

The Project involves the construction, operation, closure, and reclamation of an 18 million tonne-per-annum (Mt/a) open pit mine. The high-grade iron ore to be mined is suitable for international shipment after only crushing and screening and as such, no chemical processing facilities are required for this Project. A railway system will transport the ore from the mine area to an all-season deep-water port and ship loading facility at Steensby Inlet where the ore will be loaded into ore carriers for overseas shipment through Foxe Basin. A dedicated fleet of cape-sized ore carriers, capable of breaking ice, will be chartered by Baffinland from a consortium of ship owners organized by Fednav. Some non-icebreaking ore carriers and conventional ships will also be used during the open water season.

All major Project components will operate year round and, based on the currently-defined iron ore reserve, will continue to operate for about 21 years. Geological conditions suggest that additional ore may be delineated as exploration continues, potentially extending the life and/or increasing the production rate of the Project.

The Mary River site is located about 160 km south of the community of Pond Inlet (Mittimatalik) and 1000 km northwest of Iqaluit, the capital of Nunavut. Project facilities will be sited in the mine area at Mary River and port area at Steensby Inlet, with a railway line and access road connecting the two. Marine access and shipping through the construction phase and periodically during operation will occur seasonally through Milne Inlet and the existing Milne Inlet Tote Road will therefore be used periodically to access Mary River during frozen conditions. Shipping through Steensby Inlet will be seasonal through construction and year-round through operation. Access to the Project sites for personnel will be by chartered aircraft.

Site conditions play an important role in the planning and execution of the Project. The area experiences bitter cold in the wintertime and 24-hour darkness from November to January. Summers bring 24-hour daylight from May to August, but continued cool to cold conditions. While these conditions are typical of arctic environments, they substantially affect planning and logistics relative to most Project activities; but especially to shipping, procurement, construction, and field investigations.

Pre-Construction Staging

The construction and operation of major capital projects in the arctic requires significant up-front planning to address the short summer season and challenging logistics. Initial scheduling must consider the short open water periods for strategic material and supply deliveries for early works and also the activity-limiting extreme cold and darkness during the winter months until all-season facilities can be constructed and brought on-line. To facilitate this, Baffinland plans to pre-deliver in 2009 much of the materials and supplies required for the early construction works during the open water season using conventional arctic sealifts as employed to date by the Project and Nunavut communities. Sealifts carrying materials and supplies will be delivered to Milne Inlet, where they will be offloaded onto the beach and moved to Mary River via the Milne Inlet Tote Road during the winter of 2009-2010. The materials and supplies brought to Steensby Inlet will be offloaded and placed into new laydown areas that are within the planned footprint of the proposed new port facility. In addition to the sealifts, two barge camps, and bunded fuel iso-containers or a fuel tanker or barge, will be pre-positioned to overwinter in Steensby Inlet so that construction can be initiated in mid-2010, pending regulatory approval.

Construction Phase

The construction phase of the Project is expected to be carried out over a 4 year period, from 2010 through 2014. Railway construction is the critical path item for the construction phase, and as such, it will be necessary to concurrently build the railway from a number of construction locations. Construction activities for the Steensby port and the railway will be staged from the Steensby port site, and construction activities for Mary River will be staged from Milne Inlet. In addition to current facilities, a large construction camp will be positioned at Mary River as well as barge accommodations at Steensby Inlet and up to four construction camps along the rail alignment. Infrastructure such as camps and laydown areas, aggregate sources from rock quarries, and sand and gravel borrow areas will be required to support construction. The construction workforce on-site will peak at approximately 1,760 people, working 4 weeks at site followed by 2 weeks off, for a total payroll peak of 2,680 people during construction. Where possible, permanent infrastructure will be built at the onset of construction, to be used during both construction and operation phases of the Project. In many instances, temporary infrastructure will be constructed or positioned at Project sites for the duration of the construction phase only, to be removed once construction is complete.

Operation Phase

The operating life of the proposed Project is expected to be about 21 years, although additional successful exploration results could either extend the operational life, increase the annual ore production volume, or both. The open pit mine at Mary River will include waste rock storage areas, facilities for crushing and screening of ore, explosives manufacture and storage, stockpiles, rail loading and unloading, power generation, worker accommodation and support facilities such as a power plant, service and maintenance shops. About 275 people will be on-site at Mary River during operations, with another 175 workers stationed at Steensby Inlet. Access to the mine site will be by airstrip and railway from Steensby Inlet, with most supplies delivered over the railway, and only occasional winter-only use of the Milne Inlet Tote Road.

The railway from Mary River to Steensby Inlet will be 143 km long, and will deliver iron ore from Mary River to Steensby Inlet, and transport supplies from the port to Mary River. The port at Steensby Inlet will consist

of a rail loading and unloading facilities and rail service/maintenance facilities; worker accommodations; ore loading, freight and tug docks; ore stockpile and ship loading facilities, and an airstrip. A dedicated fleet of about 10 icebreaking ore carriers, operated by a shipping company contracted to Baffinland will transport most of the ore to international markets 12 months a year. Additional shipping will occur during open water.

Closure and Reclamation Phase

Conceptual mine closure planning has been completed for the Mary River Project, with the objective of reclaiming Project areas to be both physically and chemically stable in the long-term for both public safety and environmental protection. Materials and equipment will either be removed from site or disposed of in the open pit, and all hazardous materials and wastes will be removed from site to licensed disposal facilities. The open pit and waste rock stockpiles will be inspected for physical stability. Roads, airstrips and development areas will be recontoured as appropriate to provide long-term stability and reduce the potential for erosion. The closure and reclamation phase is expected to be 3-years, followed by a minimum of 5-years of post-closure environmental monitoring to verify reclamation has successfully met closure and reclamation objectives.

Regulatory Processes

There are a number of regulatory processes applicable to the Project, including conformity to the North Baffin Regional Land Use Plan and possibly an amendment to the Plan. The Project is expected to undergo an environmental review by the Nunavut Impact Review Board (NIRB), an environmental review by the *Canadian Transportation Act*, and is subject to at minimum a comprehensive study under the *Canadian Environmental Assessment Act*. Baffinland expects that each of the CTA and CEAA reviews; in addition to the public review that would be necessary to amend the land use plan will be coordinated through the NIRB review process.

Various permits, licenses and approvals will be required to be issued upon successful completion of the review processes. Land tenure through leases and shorter term land use permits will be required from the Qikiqtani Inuit Association (QIA) to access Inuit Owned Lands that surround the Mary River site, and from Indian and Northern Affairs Canada (INAC) for the port at Steensby Inlet and most of the railway. Other key approvals include a Type A Water License from the Nunavut Water Board (NWB), *Fisheries Act* authorization applications with the Department of Fisheries and Oceans (DFO), approvals or exemptions under the Navigable Waters Protection Act, and a license for explosives manufacture.

The pre-construction staging is expected to be authorized prior to the completion of the Project review by NIRB. Article 12.10.2(b) gives NIRB the expressed authority to approve or issue licenses for certain exploration or development activities related to the Project if, in their judgment, it is appropriate to allow the activity to proceed prior to completion of the full review. Baffinland will apply to NIRB, pursuant to Article 12.10.2(b), to allow pre-construction staging to take place in 2009. Baffinland's development schedule presumes that this exemption will be obtained.

Stakeholder Engagement and Project Scoping

Stakeholder engagement has been an important part of the Project, engaging local communities and knowledge holders through dialogue and participation in the Project. Efforts have been and continue to be guided by the following objectives:

- To adequately scope and conduct environmental and socio-economic baseline studies
- To understand local conditions and issues both through the scientific process as well as by engaging in dialogue with local communities and knowledge holders
- To incorporate local knowledge and concerns into Project design at an early stage
- To appropriately scope an environmental assessment for the proposed Project

Baffinland established a network of community liaison offices (CLO) in 2007, which will remain in place during construction and operation phases. These offices are located in Baffinland's points-of-hire locations of (listed in alphabetic order) Arctic Bay, Clyde River, Hall Beach, Igloolik, Iqaluit and Pond Inlet. This network of CLO offices facilitate training and employment opportunities for land claims beneficiaries and are made available to all contractors working on the Project. Inuit knowledge studies are also ongoing in each of these communities.

Baffinland will operate direct flights to and from the Mary River site to Baffinland's designated points-of-hire locations. The point-of-hire locations define the Project's social zone of influence. Residents in the region that do not live at points-of-hire will not be precluded from working at the mine.

Proposed EIS Guidelines have been developed by Baffinland through its own familiarity with the Project and Project site, its own scoping activities, consultation with communities, and referral to EIS guidelines developed for other mining projects. Baffinland has provided these guidelines for NIRB's, NPC's and the NWB's consideration for adoption in whole or in part, to facilitate scoping and the development of NIRB-issued guidelines for the preparation of the Project Environmental Impact Statement.

ᓱᕐᑯᐃᓇᕐᓗᑎᒃ ᑎᑎᖅᑦ ᓇᐃᓪᓕᒋᐊᕐᓯᒪᔪᑦ

ᓯᕗᓂᐊᕈᓯᖓ

ᓄᓗᔭᖕᓂ (ᐱᓕᕆᐊᖑᓂᐊᕐᑐᖅ) ᐊᕿᒃᓯᒪᔪᖅ ᓴ/ᒃᓴᒻᓂᒃ ᐱᔭᕕᐅᓂᐊᕐᓗᓂ ᐊᒻᒪ ᓱᓇᑯᑕᕐᑎᐊᕐᓗᓂ ᕿᑭᕐᑕᓘᖕᒥ, ᓄᓇᕗᑦ ᐃᓗᐊᓂ. ᓄᓇ ᓴᕕᒃᓴᕐᓯᐅᕐᕕᐅᓂᐊᕐᑐᖅ ᐊᑐᕈᑎᖃᑎᐊᕐᑐᖅ ᐃᓄᖕᓄᑦ ᐃᓕᕐᑯᓯᖕᒋᓄᑦ, ᐱᕐᑯᓯᖕᒋᓄᑦ ᐊᒻᒪ ᐃᓄᓇᓯᐊᕐᕕᐅᑎᐊᕋᓯᐊᕐᓗᓂ ᐃᓄᖕᓄᑦ ᐱᓇᓯᐊᕐᐅᕙᒃᓗᓂ ᓄᓇᖓ ᐊᒻᒪ ᑕᕆᐅᖓᓂᑦ ᐊᒻᒪ ᐸᐸᑎᔪᑎᒋᓗᓂᔪᖅ ᐃᓄᐃᑦ ᐃᓕᕐᑯᓯᖕᒋᓂᒃ.

ᓄᓗᔭᖕᒥ ᓴᕕᒃᓴᕐᓯᐅᕐᑎᑦ (BIMC) ᑲᒻᐸᓂᐅᔪᖅ ᑲᓇᑕᒥᐅᑕᐅᓗᓂ ᑕᐅᑐᖃᖅᑲᕐᓗᓂ ᓴ/ᒃᓴᕐᓯᐅᕐ/ᖕᒥᒃ ᓴᕿᑎᑎᓂᐊᕐᓂᕐᒥᒃ ᓄᓗᔭᖕᓂ. ᐱᒋᐊᓚᐅᕐᓯᒪᔪᖅ ᐊᕐᕌᒍ 2004, ᓄᓗᔭᒥ ᓴᕕᒃᓴᕐᓯᐅᕐᑎᑦ (Baffinland) ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᐱᐊᓂᒃᓯᒪᓕᕐᑐᑦ ᐃᑯᑦᕐᐸᒃᓗᑎᒃ ᐊᒻᒪ ᖃᐅᔨᓴᕐᐸᒃᓗᑎᒃ ᐊᕙᑎᓕᕆᓂᕐᒥᒃ ᐊᒻᒪ ᐃᓄᓯᓕᕆᓂᕐᒥᒃ ᓄᓗᔭᑉ ᓄᓇᖓᓂ. ᓇᓗᓇᐃᔭᕐᓯᒪᑎᐊᕐᑐᒻᒥᒃ ᖃᐅᔨᓴᕐᓂᕐᒥᒃ ᐱᓕᕆᐊᖃᕐᓯᒪᔪᑦ ᐊᒻᒪ ᐃᓚᖃᕐᓗᓂ 43%101 ᓱᓇᑯᑦᓕᕆᓂᕐᓂᒃ ᐱᐊᓂᒃᓯᒪᑎᐊᕐᓗᑎᒃ ᐊᒻᒪ ᓴᕕᒃᓴᔭᓃᒃ ᑲᑎᕐᓯᓯᒪᓕᕐᓗᑎᒃ ᖃᐅᔨᓴᕐᑕᐅᓚᕐᑐᒪᓂᒃ 2007 ᐊᒻᒪ 2008ᒥ.
ᑕᒪᓇ ᐅᔭᕈᒃᓯᐅᕐ/ᐅᓂᐊᕐᑐᖅ ᐃᒪᓇᐃᓕᐅᕐᕕᐅᓂᐊᕐᑐᖅ ᐃᒡᓗᓕᐅᕐᓗᑎᒃ, ᐃᖃᓇᐃᔭᕐᕕᒋᓗᒍ ᐊᒻᒪ ᓴᕕᒃᓴᒻᒥᒃ ᐊᖏᑎᒋᔫᒻᒥᒃ 18 ᒥᓕᐊᓐᓂᒃ ᑖᓴ ᐊᖏᑎᒋᔫᒻᒥᒃ ᐊᕐᕌᒍᑕᒫᑦ ᐱᔭᕕᒋᕙᒃᓗᒍ. ᑕᒪᓇ ᓴᕕᒃᓴᔭᒃ ᐱᐅᓂᖓᓄᑦ ᓄᓇᒻᒥᑦ ᐱᔭᕐᑕᐅᒍᓐᓂ ᓯᕐᑯᑎᕐᑕᐅᑐᐃᓇᕐᓗᓂ ᐅᒥᐊᕐᔪᐊᒨᑦ ᐅᓯᓕᐅᔭᐅᖃᕐᑕᕐᓂᐊᕐᑐᖅ ᓱᓇᑐᐃᓇᕐᓂᒃ ᕐᑯᐊᕐᓴᕐᓇᕐᑐᓐᓂᒃ ᐊᑐᖃᑕᔭᖕᒋᑐᑦ. ᓄᓇᓯᐅᑎᑯᑕᖕᒥᒃ ᐊᑐᖃᕐᑕᓂᐊᕐᑐᑦ ᓴᕕᒃᓴᒻᒥᒃ ᐅᓯᒃᑲᕐᑕᐅᑕᐅᓂᐊᕐᑐᒻᒥᒃ ᓄᓗᔭᓂᑦ ᑲᖏᕐᓗᒃᔪᐊᕐᒨᑦ ᐊᒻᒪ ᑲᖏᕐᓗᒃᔪᐊᕐᒥ ᐅᒥᐊᕐᔪᐊᒨᑦ ᐅᓯᓕᐅᔭᐅᕙᒃᓗᑎᒃ ᓴᕕᒃᓴᔭᐃᑦ ᐊᒻᒪ ᐅᒥᐊᕐᔪᐊᖅ ᓴᓂᕐᕙᔭᐅᑉ ᐊᒻᒪ ᐃᒡᓗᓕᐅᑉ ᑕᕆᐅᖓᒍᑦ ᐃᖕᒋᕋᕙᒃᓗᓂ. ᑖᓇ ᓴᕕᒃᓴᓕᐅᕕᒃ ᐊᐅᓚᓂᐊᕐᑐᖅ ᐊᕐᕌᒍᓐᓂᒃ 21ᓂᒃ.

ᓱᓇᑯᑖᓂᒃ ᓴᓇᕙᓕᐊᓂᖅ ᓯᕗᓕᕐᐸᒻᒥᒃ

ᐃᒡᓗᓕᐅᕐᓂᖅ ᐊᒻᒪ ᐊᐅᓚᑎᔪᑕᐅᓂᐊᕐᑐᓐᓂᒃ ᓴᓇᓐᓂᖅ ᐅᑭᐅᕐᑕᕐᑐᒻᒥ ᐱᑐᐃᓇᐅᖏᒪᑦ ᑭᓯᐊᓐᓂ ᐸᕐᓇᑎᐊᕐᓯᒪᔪᓇᐊᖅᑐᖅ ᐃᓱᒪᒋᓗᒋᑦ ᐊᐅᔭᖓ ᓇᐃᑐᑯᓗᓯᖑᒪᑦ ᐊᒻᒪ ᓄᓇᑕᖓ ᓄᓇᑐᓗᓐᓂ. Hᒃᑯᐊ ᓄᓗᔭᖕᒥ ᓴ/ᒃᓴᕐᓯᐅᕐᑎᑦ (Bafffinland) ᐸᕐᓇᒃᓯᒪᔪᑦ ᑕᒪᑯᐊ ᓱᓇᑯᑕᒥᔭᐅᓂᐊᕐᑐᓐᓂᒃ ᐃᒡᓗᓕᐅᕐᓂᐊᓕᕐᓗᓂ ᐱᔭᐅᔭᓇᐊᖅᑐᓐᓂᒃ ᑎᑭᑎᑦᓚᕐᑐᑦ 2009 ᐊᐅᔭᖓᓐᓂ.

ᐃᒡᓗᓕᐅᓕᕐᐸᑦᑕ

ᑕᐱᑳᓂ ᐃᒡᓗᒋᔭᐅᓂᐊᕐᑐᑦ ᐊᒻᒪ ᓱᓇᑯᑕᒋᔭᐅᓂᐊᕐᑐᑦ ᓴᓇᔭᐅᕙᓕᐊᓂᐊᕐᑐᓇᔭᐅᔪᑦ ᐊᕐᕌᒍᓐᓂᒃ ᑎᓴᒪᓐᓂᒃ (4), ᐱᒋᐊᕐᓗᑎᒃ ᐊᕐᕌᒍ 2010. ᐃᒡᓗᓕᐅᕐᓂᐊᕐᓂᖅ ᑲᖏᕐᓗᒃᔪᐊᕐᒥ ᐅᓯᒃᑲᕐᕕᐅᓂᐊᕐᑐᒥᒃ ᐊᒻᒪ ᓄᓇᓯᐅᑎᑯᑖᒍᑦ ᐊᕐᑯᑎᒋᔭᐅᓂᐊᕐᑐᖅ ᑲᖏᕐᓗᓪᒃᔪᐊᕐᒥᑦ ᐱᒋᐊᓚᕐᑐᖅ ᑕᒪᑯᐊ ᓯᓚᑖᓂ ᓴᓇᔭᐅᕙᓕᐊᓂᐊᕐᑐᑦ ᐱᒋᐊᓚᕐᑐᑦ ᕿᖑᐊᓐᓂᑦ. ᓴᓇᓚᕆᓕᕐᐸᑦᑕ ᓱᓇᑯᑦᓴᓐᓂᒃ ᐊᒻᒪ ᐃᒃᓗᒋᐅᓂᐊᕐᑐᒃ ᓴᓇᔪᖅᑲᓚᕐᑐᖅ ᖕ,ᒻᖅᔭᓂᒃ ᓴᓇᔨᓐᓂᒃ ᐱᓇᓱᐊᕈᓯᖕᓂᒃ ᑎᓴᒪᓐᓂᒃ (4) ᐊᒻᒪ ᐱᓇᓱᐊᕈᓯᑦ ᒪᕐᕉᒃ (2) ᓄᖃᖕᖓᒃᓗᑎ, ᐊᑭᓕᕐᓱᕐᑕᐅᔪᖃᓚᕐᑐᖅᖢ ᓴᓇᔨᓐᓂᒃ 2,80ᓂᒃ ᐃᒃᓗᓕᐅᓚᓕᕐᐸᑦᑕ. ᐃᒃᓗᓕᐅᓚᓕᕐᐸᑦᑕ ᓴᓐᓂᖏᓐᓂ ᐃᒃᓗᒋᐅᓚᐅᐱᓚᖕᓂᐊᕐᑐᓐᓂᒃ ᐊᒻᒪ ᓄᓇᖓᓐᓂᒃ ᐊᕿᒃᓱᐃᓗᑎᒃ ᐊᒻᒪ ᑐᐊᐸᒃᑕᓇᐊᖅᑲᑕᓗᓇᓗᑎᒃ ᐃᒃᓗᓕᐅᕐᕕᒃᓴᓐᓂᒃ.

ᐊᐅᓚᑎᓚᓂᓕᕐᐸᑦᑕ

ᐊᒻᒧᑦ ᐊᒃᑲᒃᑕᐅᑕᐅᓗᓂ ᓴᕕᒃᓴᖅ ᐱᔭᕐᑕᐅᕙᓕᐊᓂᐊᕐᑐᖅ ᐊᒻᒪ ᐅᔭᖅᑦ ᐊᑐᕐᑕᐅᔭᖕᒋᑐᑦ ᓴᓂᕐᕙᒃᑕᐅᕙᓕᐊᓂᐊᕐᓗᑎᒃ ᓴᕕᒃᓴᔭᒃ ᓯᕐᑯᑎᑕᐅᕕᖃᓚᕐᑐᖅ , ᖃᕐᑕᔪᓂᒃ ᐃᓕᓯᕕᒃᑕᖃᕐᓗᓂ ᐊᒻᒪ ᓱᓇᑯᑕᖃᕐᕕᖃᕐᓗᓂ, ᓄᓇᓯᐅᑎᑯᑖᒍᑦ ᐅᓯᖃᕐᑕᕐᕕᒃ ᐊᒻᒪ

ᐅᓯᖏᔭᕐᕕᒃᑫᓐᓂ, ᐃᑯᒪᒃᑐᑎᖃᕐᓗᓂ, ᐃᖃᓇᐃᔭᕐᑎᑦ ᐃᒡᓗᒃᓴᖏᓐᓂᒃ ᓴᓇᓗᑎᒃ ᐊᒪᓗ ᓱᓇᑯᑕᕐᕕᒃᑫᓗᑎᒃ ᐊᒪᓗ ᓴᓇᕕᒃᑫᓗᑎᒃ. ᐱᒪᖅ ᒫᓂ 275ᓂᒃ ᓴᓇᔩᑕᖃᑦᑐᖅ ᓄᓗᔾᔪᓂᑐᓐᓂᒃ, ᐊᒪᓗ 175ᓂᒃ ᓴᓇᔩᑕᖅᑳᓐᓂᕐᓗᓐᓂ ᑲᖏᓚᒃᔪᐊᕐᒥ. Hᓐᓇ ᓴᕕᒃᓴᓕᕆᕕᒃ ᐅᐸᒃᑕᐅᔪᓇᖃᑦᕐᓂᐊᕐᑐᖅ ᑎᖕᒥᓱᑯᑦ ᐊᒪᓗ ᓄᓇᓯᐅᑎᑯᑕᑯᑦ, ᐊᒪᓗ ᓱᓇᑯᑕᓕᒪᑦ ᓄᓇᓯᐅᑎᑯᑕᑯᑦ ᐊᒡᔭᕐᑐᕐᑕᐅᖃᑦᕐᓂᐊᕐᑐᑦ, ᐊᒪᓗ ᐃᓚᓐᓂᑯᑦ ᐅᑭᐅᖑᒐᓗᐊᕐᑎᓗᒍ ᐊᑐᕐᑕᐅᖃᑦᕐᓂᐊᕆᓗᓐᓂ.

ᑕᒪᓇ ᐊᕐᑯᑎᐅᔪᖅ ᓄᓇᓯᐅᑎᑯᑕᖕᒍᑦ ᓄᓗᔾᔪᓂᑦ ᑲᕐᓗᒃᔪᐊᒍᑦ ᐅᖓᓯᒃᑎᒋᔪᑦ 143 ᑭᓚᒥᑕ ᐊᒪᓗ ᐅᓯᖃᑕᐅᑎᐅᓂᐊᕐᓗᓐᓂ ᓴᕕᒃᓴᔭᖕᒥᒃ ᓄᓗᔾᔪᓂᑦ ᑲᖏᕐᓗᒃᔪᐊᕐᒍᑦ ᐊᒪᓗ ᐅᒥᐊᕐᔪᐊᑯᑦ ᑎᑭᐸᓕᐊᔫᓐᓂᒃ ᐅᓯᖃᕐᑕᐅᑕᐅᖃᑦᕐᓂᐊᕐᓗᓐᓂ ᓄᓗᔾᔪᓄᑦ. Hᕗᓐᓂ ᑲᖏᕐᓗᒃᔪᐊᒻᒥ ᐅᓯᓕᕐᑐᕐᕕᒃᑫᓂᐊᕐᓗᓐᓂ ᓄᓇᓯᐅᑎᑯᑕᖕᒍᑦ ᐊᒪᓗ ᐅᓯᖏᐊᕐᕕᒃᑫᓗᓐᓂ ᐊᒪᓗ ᓄᓇᓯᐅᑎᑯᑕᖕᒥᒃ ᓴᓇᕕᒃᑫᓗᓐᓂ; ᓴᓇᔨᑦ ᐃᒡᓗᖏᓐᓂᒃ ᐱᑕᖃᕐᓗᓐᓂ; ᓴᕕᒃᓴᓐᓂᒃ ᐅᓯᖃᕐᑕᕐᕕᒃᑫᓗᓐᓂ; ᑐᓚᒃᑕᕐᕕᒃᑫᓗᓐᓂ ᐊᒪᓗ ᒥᑕᕐᕕᒃᑫᓗᑎᒃ. ᖁᓕᓂᒃ (10) ᐅᒥᐊᕐᔪᐊᓐᒃ ᓯᑯᓯᐅᑎᓐᓂᒃ ᐱᑕᖃᓚᕐᑐᖅ, ᐊᐅᓚᑕᐅᓂᐊᕐᓗᑎᒃ ᑳᑐᓚᒃᓯᒪᔫᓐᓂᒃ ᑳᑐᓚᖃᑎᒃᑫᓗᑎᒃ ᓴᕕᒃᓴᕐᓯᐅᑎᓐᓂᒃ (Baffinland) ᐊᒪᓗ ᑕᓇᐅᑉ ᐊᑭᐊᓄᑦ ᓴᕕᒃᓴᓐᓂᒃ ᐊᒡᔭᕐᓯᖃᑦᕐᓂᐊᕐᓗᑎᒃ ᐊᕐᕿᒍᓕᒪᖅ ᑕᕿᑦ 12. ᐸᒪᓗ ᐊᐅᔭᑯᑦ ᐅᒥᐊᕐᔪᐊᑲᓂᕐᓂᒃ ᑎᑭᑐᒃᖃᑦᕐᓂᐊᕆᓗᓐᓂ

ᑖᓇ ᓴᕕᒃᓴᕐᓯᐅᕐᕕᒃ ᒪᑐᔭᐅᒃᐸᑦ

ᐸᕐᓇᒃᑕᐅᓯᒪᖕᒥᔪᖅ ᑕᓇ ᓴᕕᒃᓴᕐᓂᐊᕐᕕᒃ ᒪᑐᔭᐅᓚᕆᐊᖖ ᐊᒪᓗ ᒪᑐᔭᐅᒍᓐᓂ ᓄᓇᑕᖖ ᐃᔩᖁᓯᑐᖅᖖᓄᑦ ᐊᕿᒃᑕᐅᓇᓱᐊᓚᕐᓗᓐᓂ ᓱᕈᔭᐃᑎᐊᕋᓱᐊᕐᓗᒍ. ᐱᖁᑎᑦ ᐊᒪᓗ ᓱᓇᒃᑯᑕᑦ ᐱᔭᕐᑕᐅᓚᕐᑐᑦ ᐅᕙᓗᓐᓂᑦ ᓴᐅᔭᐅᓗᑎᒃ.ᐊᒪᓗ ᓱᓇᑐᐃᓇᐃᑦ ᐱᖁᑎᑦ ᖁᐊᓴᕐᓇᕐᑐᖅᑐᑦ ᖁᐊᕐᓴᕐᓇᕐᑐᓐᓂᒃ ᐱᓕᕆᐳᐅᔪᓄᑦ ᓚᐃᓴᓐᓯᖅᑐᓄᑦ ᐊᐅᓚᕐᑎᑕᐅᓇᔭᕐᑐᑦ. ᐊᒪᓗ ᐃᓱᒪᓇᕐᓗᓐᓂ ᓄᓇᑕᖖ ᓴᓗᒪᖅᓴᕐᑕᐅᓇᔭᕆᐊᖖᓐᓂᒃ ᐊᕐᕿᒍᓄᑦ ᐱᖖᓯᓄᑦ (3) ᐊᒪᓗ ᐊᕐᕿᒍᑦ ᑕᓕᒪᑦ (5) ᐊᓂᒍᕿᓱᐊᕐᓂᖏᓐᓂ ᖃᐅᔨᓴᕐᑕᐅᔭᕐᑐᖃᑦᑕᓚᕐᓗᓐᓂ ᖃᓄᐃᖏᑲᓗᐊᕐᒪᖖᑦ.

ᒪᓕᒐᐃᑦ ᐊᑐᕐᑕᐅᔭᕆᐊᓕᑦ

ᐅᓄᕐᑐᒐᓚᖕᓂᒃ ᐊᑐᐊᒐᕐᓂᒃ-ᒪᓕᒐᓐᓂᒃ ᐱᑕᖅᕐᒪᑦ ᒪᓕᒃᑕᐅᔭᕆᐊᓕᖕᓂᒃ ᑕᑯᓇᖖᑦ ᓴᕕᒃᓵᓕᕆᔩᓐᓂᑦ. ᐃᓚᖅᑲᓐᓂ ᕿᑭᕐᑕᓗᐸ ᖁᓕᖖᖖᓄᑦ ᓄᓇᒻᒥᒃ ᐊᑐᕐᑐᐊᕐᓂᐊᕐᓗᓐᓂ ᐸᕐᓇᐅᑕᐅᔭᕆᐊᖃᕐᑐᓐᓂᒃ ᐊᑐᕆᐊᖃᓗᑎᒃᐊᒪᓗ ᐸᕐᓇᐅᑎ ᐊᕿᒥᐊᕐᑕᐅᔪᓴᕈᑕᓐᓂᒃ, ᐊᒪᓗ ᐊᓯᖏᑦ ᐊᕙᑎᒍᑦ ᐸᕐᓇᐅᑎᑦ ᐊᒪᓗ ᑕᒪᑯᐊ ᐊᕿᒃᓱᕐᑕᐅᓕᕈᑎᒃ ᓄᓇᕗᒻᒥ ᓄᓇᒧᑦ ᓇᒧᒍᓂᑐᐃᓇᕆᐊᖃᕐᑐᓐᓂᒃ ᑲᒪᔩᐅᔪᑦ ᐱᖃᑎᒥᓗᒋᑦ ᐸᕐᓇᐃᓚᕐᑐᑦ. ᑕᐃᒪᓕ ᑕᒪᓇ ᖃᐅᔨᓴᕐᓂᖅ ᐱᐊᓂᒃᑕᐅᒃᐸᑦ , ᐱᔪᓇᐅᑎᓐᓂᒃ ᐸᐃᐸᓐᓂᒃ , ᓚᐃᓴᓐᓯᓕᕆᓂᖅ ᐊᒪᓗ ᓇᒪᒋᔭᐅᓂᖖ ᐱᐊᓂᒃᑕᐅᒃᐸᑦᑕ ᑖᓇ ᓴᕕᒃᓴᕐᓯᐅᕐᕕᒃ ᐱᓕᕆᐊᕆᔭᐅᕆᐊᓚᓚᕐᑐᖅ.

ᓄᓇᖃᕐᑎᐅᔪᑦ ᐃᓚᐅᓂᖏᑦ ᐊᒪᓗ ᑕᐅᑐᖃᑕᐅᓂᖏᑦ ᐱᓕᕆᐊᖑᓂᐊᕐᑐᒥᒃ

ᓄᓇᖃᕐᑎᐅᔪᑦ ᐃᓚᐅᓂᑦ ᐊᑐᕈᑎᖃᑎᐊᕐᓯᒪᔪᖅ ᑕᒪᑐᒧᖖ ᐱᓕᕆᐊᖑᓂᐊᕐᑐᒧᑦ, ᐃᓚᐅᑎᑕᐅᓗᑎᒃ ᓄᓇᓕᑦ ᐊᒪᓗ ᖃᐅᔨᑲᐃᖃᑦᕐᓗᒋᑦ ᖃᐅᔨᒪᔭᑐᖃᕐᒥᖕᓂᒃ ᑲᑎᒪᓂᑯᑦ ᐊᒪᓗ ᐃᓚᐅᖃᑦᕐᓂᑯᑦ ᐱᓕᕆᐊᖃᕐᑎᓗᒍ ᑕᒪᑐᒥᖖ ᓴᕕᒃᓴᓕᕆᓂᐅᓂᐊᕐᑐᒥᒃ. ᑖᒃᑯᐊ Baffinland ᐊᕿᒃᓯᓯᒪᓕᕐᑐᑦ ᓄᓇᓕᖕᓂ ᐃᖃᓇᐃᔭᕐᑎᑕᕐᓗᑎᒃ ᖃᐅᔨᒪᔩᑕᐅᓂᐊᕐᑐᓐᓂᒃ ᐊᕐᕿᒍ 2007 ᐊᒪᓗ ᑖᒃᑯᐊ ᐃᖃᓇᐃᔭᐃᓇᕐᓂᐊᕐᓗᑎᒃ ᑕᐱᖕᓇ ᐅᔭᕋᖕᓂᐊᕐᕕᒃ ᓴᓇᔭᐅᓂᖖᓐᓂ ᐊᒪᓗ ᐊᐅᓚᓚᓇᓕᕐᐸᑦ. Hᒃᑯᐊ ᖃᐅᔨᒪᔩᑕᐃᑦ ᐊᓪᓚᒃᐱᖃᕐᑐᑦ ᐃᒃᐱᐊᕐᔪᖕᒥ, ᑲᖏᕐᓗᒐᐱᖕᒥ, ᓴᓂᕋᔭᖕᒥ, ᐃᒡᓗᓕᖕᒥ, ᐃᖃᓗᖕᓂ ᐊᒪᓗ ᒥᑎᒪᑕᓕᒃ. Hᒃᑯᐊ ᖃᐅᔨᒪᔩᑕᐃᑦ ᐊᕐᑯᑎᒋᔭᐅᓗᑎᒃ ᐱᓕᕆᖃᑦᕐᓂᐊᕐᑐᑦ ᐃᖃᓇᐃᔭᓐᓂᒃ ᐃᓕᓂᐊᕈᑎᒃᓴᓐᓂᒃ ᐊᒪᓗ ᐃᖃᓇᐃᔭᕐᑕᕿᓱᐊᕐᑐᓐᓂᒃ ᓄᓇᑕᖃᑕᐅᓯᒪᔪᑦ ᐊᒪᓗ ᓴᓇᔪᓇᕐᑎᑕᐅᓂᐊᕐᓗᑎᒃ ᑕᐱᑳᓐᓂ ᐅᔭᕋᖕᓂᐊᕐᕕᖕᒥ ᑳᑐᓚᒃᓯᒪᔫᓐᓂ. ᐱᓄᐃᑦ ᖃᐅᔨᒪᔭᑐᖃᖏᑦ ᐱᓕᕆᐊᕆᔭᐅᖏᓇᕐᑐᑦ ᑕᒪᑯᓇᓐᓂ ᓄᓇᓕᖕᓂ.

BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT

DEVELOPMENT PROPOSAL FOR THE
MARY RIVER PROJECT

TABLE OF CONTENTS

PAGE

VOLUME ONE

TABLES

FIGURES

VOLUME TWO

APPENDICES

BAFFINLAND IRON MINES CORPORATION
MARY RIVER PROJECT

DEVELOPMENT PROPOSAL FOR THE MARY RIVER PROJECT

SECTION 1.0 - INTRODUCTION

The Mary River Project ("the Project") is a proposed iron ore mine and associated facilities located on North Baffin Island, in the Qikiqtani Region of Nunavut. Baffin Island is home to Inuit, who enjoy a culture that is unique and traditional to arctic regions. The land where the Project is located is important to Inuit culture, heritage, and their continued well-being in that these people use the resources on the land and from the sea for both their subsistence and in preserving their traditional way of life.

The Project involves the construction, operation, closure, and reclamation of an 18 million tonne-per-annum (Mt/a) open pit mine. The high-grade iron ore to be mined is suitable for international shipment after only crushing and screening and as such, no chemical processing facilities are required for this Project. A railway system will transport the ore from the mine area to an all-season deep-water port and ship loading facility at Steensby Inlet where the ore will be loaded into ore carriers for overseas shipment through Foxe Basin. A dedicated fleet of cape-sized ore carriers, capable of breaking ice, will be chartered by Baffinland from a consortium of ship owners organized by Fednav. Some non-icebreaking ore carriers and conventional ships will also be used during the open water season.

All major Project components will operate year round and, based on the currently-defined iron ore reserve, will continue to operate for about 21 years. Geological conditions suggest that additional ore may be delineated as exploration continues, potentially extending the life and/or increasing the production rate of the Project.

The Mary River site is located about 160 km south of the community of Pond Inlet (Mittimatalik) and 1000 km northwest of Iqaluit, the capital of Nunavut. Project facilities will be sited in the mine area at Mary River and port area at Steensby Inlet, with a railway line and access road connecting the two. Marine access and shipping through the construction phase and periodically during operation will occur seasonally through Milne Inlet and the existing Milne Inlet Tote Road will therefore be used periodically to access Mary River during frozen conditions. Shipping through Steensby Inlet will be seasonal through construction and year-round through operation. Access to the Project sites for personnel will be by chartered aircraft.

Baffinland Iron Mines Corporation (Baffinland) is the Project proponent. Baffinland is a Canadian mining company that is publicly traded on the Toronto Stock Exchange. The company is singularly focused on the development of the Mary River Project. Its management team has varied and substantial experience in the exploration, development, operation, closure and reclamation of mining projects in an environmentally and socially sound manner. Baffinland is headquartered in Toronto Ontario and is the sole owner of the ore deposits at Mary River.

Site conditions play an important role in the planning and execution of the Project. Northern Baffin Island has a semi-arid arctic climate with less than 200 mm of annual precipitation and an annual average

temperature of about -15 ºC. The area experiences bitter cold in the wintertime and 24-hour darkness from November to January. Summers bring 24-hour daylight from May to August, but continued cool to cold conditions. The extremely cold winter temperatures and year-round cold weather result in permafrost ground that supports only sparse and short-season vegetation and soil structure which is sensitive to ground pressures and land disturbances in the summertime. Inland waterways flow for short periods during the summer, but the extreme cold winters result in most rivers and creeks either drying up or being completely frozen for much of the year. Winter also brings landfast ice in the marine inlets and along the coastline, and sea ice in the main channels. While these conditions are typical of arctic environments, they substantially affect planning and logistics relative to most Project activities; but especially to shipping, procurement, construction, and field investigations.

Baffinland commenced exploration at Mary River in 2004 and has since accomplished a number of field investigations in the region. Camp accommodations have been established at Mary River, Milne Inlet, and Steensby Inlet to support the ongoing exploration, engineering, data collection, and development programs. To date, exploration drilling, resource definition, environmental and social data collection, a scoping study (2006), and a Definitive Feasibility Study (DFS) and accompanying National Instrument 43-101 Technical Report have been completed (2008). A bulk sampling program, started in 2007, is planned for completion in 2008.

This document presents Baffinland's proposed plans to develop, operate, and close the Mary River Project as described in the DFS, and establishes the basis for scoping its social and environmental impact assessment process. It also describes the program for continued exploration which is intended to prolong the life of the Project and its consequent employment opportunities and economic benefits to the region and to the Inuit people. The document explains the logistical challenges of construction and operation in this challenging arctic environment, and presents practical concepts for site closure and reclamation, and post-closure monitoring.

This submittal will support land use applications with the Qikiqtani Inuit Association (QIA) and Indian and Northern Affairs Canada (INAC), Water License applications with Nunavut Water Board (NWB), and *Fisheries Act* authorization applications with the Department of Fisheries and Oceans (DFO). It also includes an information package on the Project's proposed water crossings to allow determinations to be made by Transport Canada on the presence/absence of navigable waters in relation to proposed project infrastructure. The Development Proposal and associated applications provide the requisite information for the Nunavut Planning Commission (NPC) to determine conformity to the North Baffin Regional Land Use Plan, as well as screening information establishing the basis for impact assessment scoping as required by the Nunavut Impact Review Board (NIRB) and the *Canadian Environmental Assessment Act* (CEAA).

1.1 PROJECT HISTORY

The Mary River iron ore deposit was originally discovered in 1962 by Murray Watts of British Ungava Explorations Limited (Brunex). Brunex staked ten claim groups in the Project area, including the Flo, Donna, and Mary claims which cover the areas now known as Deposit Nos. 1 (Flo); 2, 3 and 3b (Donna); and 4 (Mary). The private company Baffinland Iron Mines Ltd. (BIML) was established in 1963 by the financial participants and prospectors of the Brunex group to hold the Mary River claims and leases and to develop the prospects.

BIML undertook an exploration program from 1963 through 1966, with most of the field work carried out in the summers of 1964 and 1965. This work included the construction of the 100 km Milne Inlet Tote Road, and construction of gravel airstrips near the Mary River camp, at Milne Inlet, and at Katiktok Lake some 40 km northwest of Mary River and near Deposit No. 4. Apart from the required land surveys, some metallurgical test work, and re-examinations of project economics, no additional fieldwork was undertaken between 1965 and 2004.

In 2002, BIML interests were acquired by a current executive of Baffinland, with the purpose of revitalizing the Project. The current Baffinland Iron Mines Corporation was formed in early 2004, which now holds exclusive rights to the ore deposits at Mary River. Continuous contemporary exploration work began in 2004.

1.2 MINERAL TITLES AND LAND ACCESS

Baffinland is the sole owner of the three mineral leases at Mary River. Lease 2484 covers the iron ore deposit referred to as Deposit No. 1; Lease 2485 covers Deposit Nos. 2, 3, and 3B; and Lease 2483 covers Deposit No. 4. Deposit 3A, referenced in earlier Proponent documents as part of Lease 2485, has been confirmed as a continuous extension of Deposit 3, and therefore is no longer referenced separately. Similarly, recent drilling identified an additional ore body now referred to as Deposit No. 3B. The leases cover a total area of 1593.4 hectares (ha) and are renewable beyond the current 21-year period expiring on August 27, 2013. The location of the mineral leases is shown on Figure 1.2.

The Nunavut Land Claims Agreement (NLCA) establishes the requirements and expectations for development activities occurring in Nunavut. The mineral leases at Mary River predate the May 25, 1993 NLCA, but are surrounded by Inuit-owned surface and mineral (sub-surface) rights. Inuit owned surface rights in the area are administered by the QIA while Inuit-owned mineral rights are administered by the Inuit birthright corporation Nunavut Tunngavik Incorporated (NTI). The Mary River mineral leases are administered by INAC under the Canadian Mining Regulations of the *Territorial Lands Act* on federal (Crown) land. Access to the surrounding surface lands is provided through land use permits and leases issued by QIA or INAC as described in Section 1.3.5.

Baffinland has negotiated a memorandum of understanding (MOU) with NTI establishing a substantially larger package of prospective ground for Baffinland's continued iron ore exploration. An exploration agreement is currently being negotiated to grant to Baffinland rights to 100% interest in the minerals within, upon, or under the Inuit-owned parcel PI-17 surrounding Deposit Nos. 1, 2, 3, and 4 - an area totalling 16,903 ha. Figure 1.3 shows Baffinland's land position and the location of the PI-17 parcel relative to the Mary River deposits.

1.3 REGULATORY PROCESS OVERVIEW

The federal and territorial legislation and guidelines that are applicable to the development of the Mary River Project are presented in Table 1.1 and are summarized in the following sections.

There are a number of regulatory processes applicable to the Project, including conformity to the North Baffin Regional Land Use Plan, possibly an amendment to the same Plan. The Project is expected to undergo an environmental review by the Nunavut Impact Review Board (NIRB), an environmental review by the *Canadian Transportation Act*, and is subject to at minimum a comprehensive study under the *Canadian Environmental Assessment Act*.

Various permits, licenses and approvals will be required to be issued upon successful completion of the review processes. Land tenure through leases and shorter term land use permits will be required from the Qikiqtani Inuit Association (QIA) to access Inuit Owned Lands that surround the Mary River site and from Indian and Northern Affairs Canada (INAC) for the port at Steensby Inlet and most of the railway. Other key approvals include a Type A Water License from the Nunavut Water Board (NWB), *Fisheries Act* authorization applications with the Department of Fisheries and Oceans (DFO), approvals or exemptions under the *Navigable Waters Protection Act*, and a license for explosives manufacture.

The applicable regulatory processes and licensing are described in further detail below.

1.3.1 Conformance to Land Use Plans

Article 11 of the NLCA gives NPC the authority to review development projects to ensure conformity with approved land use plans, where they exist. Mary River Project components are located within two land-use planning regions: the North Baffin Region and the Akunniq Region. Milne Inlet, the mine site at Mary River, and about 34 km of the railway will be located within the North Baffin Planning Region where an approved Land Use Plan is in place to which the Project must conform. Most of the railway and the Steensby Inlet port will be located within the Akunniq Planning Region, which has no draft or approved land use plan in place.

The portion of the railway within the North Baffin Region is not included as a transport corridor in the North Baffin Regional Land Use Plan. Baffinland understands that the NPC views this to be a proposal for a transportation corridor requiring an amendment to the North Baffin Regional Land Use Plan. The terms of the Plan require an assessment of the preferred transportation route and its alternatives within the bounds of the planning region, as well as a public review of the route and alternatives by NPC and NIRB or a federal panel. NPC has indicated that it will participate in the environmental review of the Project as an intervener. Provided the Proponent successfully fulfills the terms of the Plan through the review process, NPC will recommend an amendment to the Plan to the Minister of INAC for approval.

1.3.2 The Nunavut Environmental Assessment Process

Article 12 of the NLCA designates responsibility to NIRB to evaluate all development projects for their potential to cause significant social or environmental impacts. This assessment is accomplished through screening and review processes. In screening a project proposal, NIRB generally will determine that a review is required when, in its judgment:

- The Project may have significant adverse effects on the ecosystem, wildlife habitat, or Inuit harvesting activities

- The Project may have significant adverse socio-economic effects on northerners
- The Project will cause significant public concern
- The Project involves technological innovations for which the effects are unknown

All projects are subject to the screening process and consequently, a completed NIRB Screening Part 1 Form for the Mary River Project is included in Appendix A. The Project will utilize proven technologies without the need for chemical ore processing, however, due to the size and scope of the Mary River Project, Baffinland proposes that a timely recommendation to the Minister for a Part 5 review is appropriate. An amendment to the Plan, if necessary, would require a review under the NLCA in any event (Section 1.3.1).

Baffinland understands that NIRB will issue its screening decision to the Minister of INAC and the Minister will designate the Project for either a Part 5 or 6 review. NIRB or a panel, and interveners, will be responsible for providing input on the scope of that review. This document presents Baffinland's proposed project, and other relevant information considered sufficient for the purposes of the scoping process.

Based on Baffinland's project description (this Development Proposal), NIRB will in-turn issue project-specific terms of reference or EIS guidelines, defining the scope and content of the social and environmental impact assessment that will be required. Proposed EIS Guidelines have been developed by Baffinland through its own familiarity with the Project and Project site, its own scoping activities, consultation with communities, and referral to EIS guidelines developed for other mining projects. Baffinland is providing these guidelines for NIRB's consideration for adoption in whole or in part, to facilitate scoping and the development of NIRB-issued guidelines for the Part 5 review (Appendix B).

Based on the NIRB-issued final EIS Guidelines, Baffinland will develop, or cause to be developed, a Draft EIS which will collectively refer to the following documents:

- **Summary Text from/or Impact Assessment** - This report will document the current site conditions, describe the development and operating plans, identify engineering and environmental systems that will be used to control social and environmental impacts, present mitigation measures to limit social and environmental impacts to acceptable levels and maximize positive impacts, and identify the Project effects and residual impacts on both environmental and social resources. It will also address the cumulative effects of Project development and evaluate plausible alternatives. The document will meet NIRB's 10 minimum EIS requirements and the Project-specific EIS Guidelines.

- **Mitigation and Monitoring Plan** - This plan will define the management, mitigation, monitoring, and institutional measures that are needed to mitigate, offset, or reduce the social and environmental impacts of the Project to acceptable levels and to enhance beneficial impacts. It will define the actions that must be undertaken and identify who is responsible to undertake them to implement the mitigation required by the EIS.

- **Appendices** - The EIS documents will be presented in a concise, easy-to-read format which obliges that summaries and concepts be presented in the body of the EIS text, and the technical details supporting those information be presented in the Appendices. The Appendices will be used to provide supporting technical details for EIS text summaries of appropriate elements of the Project design, public consultation programs, baseline and impact assessments, monitoring programs, and management plans.

After receipt of the Draft EIS for the Project, NIRB will determine whether the submission addresses the requirements of the EIS Guidelines, and is in conformance with the NLCA. Any outstanding issues must be resolved and a Final EIS will be delivered. Following a public review process, NIRB will make an approval recommendation on the Final EIS to the Minister of INAC. Upon ministerial approval, NIRB will issue a Project Certificate authorizing the Project to proceed.

The environmental assessment review process pursuant to Article 12 of the NLCA is required for all major projects in Nunavut. At the federal level, all potentially significant projects in Canada are also subject to an environmental review process pursuant to the *Canadian Environmental Assessment Act* (CEAA). The Project's mining activities, marine terminal, railway, and all-weather airstrip all fall under the CEAA Comprehensive Study List Regulations, requiring a federal comprehensive study level of environmental assessment under CEAA. Baffinland is working with the relevant federal Authorizing Agencies to reduce redundancies in the Project review process.

Before Baffinland can proceed with railway construction, approval must be granted by the Canadian Transportation Agency (CTA) under Section 98 of the *Canadian Transportation Act*. This process also requires a social and environmental review to ensure that the location of the railway line is reasonable taking into consideration the requirements for railway operations and the competing interests of communities and ecological values that may be affected by installation of the line. CTA has indicated that it will participate in the NIRB review process to fulfill this requirement.

1.3.3 Inuit Compensation and Benefits

Implementation of the Mary River Project has the potential to contribute substantially to the economic development of local communities, the North Baffin Region, and Nunavut. Baffinland will work with the QIA and other regulatory agencies to facilitate the equitable distribution of Project benefits among the Inuit people who are affected by the Project. Article 26 of the NLCA addresses the requirements for Inuit Impact and Benefit Agreements (IIBA).

Baffinland initiated negotiations with the QIA on an IIBA for the Project in 2006. These discussions are currently ongoing in anticipation of completing a mutually acceptable IIBA prior to Project commencement, as required by NLCA. The IIBA must be consistent with the terms and conditions of Project approvals, including those established pursuant to the environmental review process, and the IIBA negotiations may inform and influence the NIRB process and resulting Project Certificate. Consequently, the IIBA is not finalized until completion of the environmental review process.

Once Baffinland and QIA finalize the IIBA, a copy is sent to the INAC Minister. The IIBA goes into effect 30 days following its receipt by the Minister unless the Minister determines, within that

timeframe, that the IIBA does not conform to the provisions of the terms and conditions established in the social and environmental review process or the provisions set out in Article 26 of the NLCA.

In addition to the IIBA requirement, Article 20 of the NLCA assigns exclusive rights to the use of water on, in, or flowing through Inuit-owned land to the local Inuit organization (in this case the QIA). If it is determined through the environmental review process that Project activities are expected to substantially affect the quality, quantity, or flow of water on Inuit-owned lands, Baffinland would be required to enter into a compensation agreement with the QIA as part of its water licensing process.

1.3.4 Target Date for Project Certificate Receipt

Baffinland anticipates that all necessary permits and authorizations can be obtained in time to support a summer 2010 construction start date, based on both supply chain logistics and the review times recommended in various regulatory guidance documents. This permitting schedule is important to construction logistics in that the Project construction schedule is substantially predicated on the ability to position materials and supplies into the area during suitable weather and shipping conditions.

Current Project schedule milestones include:

- February 2008 - Definitive Feasibility Study issued
- March 2008 - issue this Development Proposal and core applications needed to initiate regulatory processes
- December 2008 - issue draft EIS
- August/September 2009 - stage equipment and materials at Steensby Inlet, Milne Inlet and Mary River (using winter road November 2009 to May 2010) to facilitate a 2010 construction start date
- April 2010 - Project Certificate issued
- June 2010 - Permits issued for construction
- July 2010 - initiate mine construction
- Early 2014 - Project commissioning
- May 2014 - first shipment of ore

In establishing the target completion schedule, Baffinland is assuming that appropriate streamlining of the review process can be accomplished, e.g., by conducting cooperative review and hearings as contemplated in both the NLCA and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*, and by eliminating redundancies in the regulatory requirements. The covering letter to this document and accompanying “roadmap” outline a coordinated review schedule.

1.3.5 Other Applications Supported by this Document

A number of authorizations will be required to develop the Project for activities such as water use and waste disposal, land use, explosives manufacturing, and impacts to fish and fish habitat. Tables 1.2 and 1.3 outline the various federal and territorial authorizations applicable to the Project, their associated regulatory agencies, and relevant Project components.

Through consultation with the applicable regulatory agencies, four "core" authorizations have been identified to facilitate conformity determination to the North Baffin Regional Land Use Plan by NPC, and environmental screening by NIRB. As such, these agency-specific applications have been included as Appendix C, and this document comprises the relevant Project information to support these applications. Each of these core applications will be submitted to the jurisdictional agency along with a copy of this document.

The four core applications include:

- **Water License Application** - The water licensing process is under the purview of the Nunavut Water Board (NWB) in accordance with Article 13 of the NLCA, the *Nunavut Water and Nunavut Surface Rights Tribunal Act* and the Northwest Territories Water Regulations. Once a Project Certificate is issued by NIRB, a Type A Water License can be issued by NWB. Environmental reviews are required as part of the water licensing process but again, NIRB is expected to do a full social and environmental review for the Project as a whole. Sections 13.5.2 and 13.6.1 of the NLCA, and Section 37 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* both provide opportunities for coordinating efforts between NWB and NIRB and consequently, Baffinland is engaging with both agencies in an effort to streamline the process.

- **Application for Use of Inuit-Owned Land** - Much of the Mary River site and the land between Mary River and Milne Inlet is located on Inuit-owned land administered by the QIA. Project components on Inuit land include the Milne Inlet ship docking and offloading site, the mine site, and the majority of the Milne Inlet road except for a portion south of Katiktok Lake. Figure 1.2 shows the boundaries of the Inuit-owned land in relation to the various Project components. A Land Lease authorizing the construction of Project infrastructure and other activities (an amendment to Baffinland's existing Commercial Lease) and a Quarry Concession Permit for quarrying activities during construction, operations, closure and reclamation must be obtained from the QIA for those activities to proceed.

- **Application for Use of Crown Land** - Most of the land south of the Mary River site is on Crown land. Project components on Crown Land include the railway, the Steensby Inlet port facilities, and a small portion of the Milne Inlet Road south of Katiktok Lake. Land use authorizations on Crown land are obtained from INAC pursuant to the *Territorial Lands Act* and will include a Type A Land Use Permit for Project infrastructure and activities supporting construction, a Land Lease allowing for the infrastructure and activities associated with the railway alignment and Steensby Inlet port site, quarry permits for construction and leases to support operation and maintenance of the quarries, and a water lot lease for project activities, docks and infrastructure in near shore waters at Steensby Inlet. Because the Project footprint on Crown land is greater than 640 acres, an Order-in-Council must be obtained from the Cabinet before the Minister of INAC can issue the leases.

- **Fisheries Authorization Application** - Unavoidable impacts to fish and fish habitat resulting from the Project must be authorized by DFO under the *Fisheries Act*. An application and

covering letter are accompanied by an assessment of existing fish habitat characteristics has been appended in Appendix C.

In addition to the core applications, Transport Canada - Navigable Waters Protection Program (TC-NWPP) requested an information package to determine whether or not the Project will affect navigable waters. A transmittal letter to TC-NWPP, included in Appendix D, highlights the location of information in this document that is of particular relevance and interest to this agency.

Supporting technical information to support both land tenure applications, the DFO application for an authorization and the information requirements of TC-NWPP, are included in Appendix E. This includes the following:

- Appendix E1 - Conceptual railway drawings showing the current railway alignment, proposed quarries, construction camps, and proposed lease and construction land use boundaries in relation to the current alignment
- Appendix E2 - Railway watercourse crossings assessments – showing locations, photographs and watercourse measurements at, upstream and downstream of railway crossings
- Appendix E3 - The proposed railway alignment will encroach on a number of lakes due to grade and turning radius constraints implicit with a railway (Section 4.3). Assessments of lake encroachment sites based on the summer 2007 alignment are documented.
- Appendix E4 - The aggregate sources identified from desktop review to be near to watercourses (drainages, streams, lakes and ponds) were visited to document fish habitat
- Appendix E5 - A construction access road, required for railway construction, will deviate from the railway alignment along Cockburn Lake, due to the steep cliffs. Watercourse crossings along the preliminary construction access road alignment were assessed in the same manner as the railway alignment watercourse crossings included in Appendix F2.
- Appendix E6 – A list of all drainages, locations and preliminary assignment of proposed crossing structures is provided, conceptual drawings for typical watercourse crossings using culverts and single span bridges are provided as well as site-specific conceptual crossing designs for major watercourse crossings along the railway at Mary River and Cockburn Lake.
- Appendix E7 - Conceptual drawings for the ore, freight and tug docks proposed at the Steensby Inlet port

While the route of the railway is not expected to materially change, the alignment itself has moved slightly since the 2007 field program, and subsequent iterations of the railway alignment have resulted in several crossings moving up- or downstream of the assessed location. The alignment shown, based on the DFS, will continue to be adjusted as additional geotechnical information becomes available. Additionally, the dock designs remain under study. The information provided is intended to provide for an understanding of the Project for scoping purposes.

1.4 ONGOING ACTIVITIES

Baffinland has been carrying out exploration and associated activities at the Mary River site since 2004. Exploration drilling has primarily been accomplished by Baffinland geologists using contracted drill rigs and crews. Other organizations that have contributed to the technical work on the Project to date include:

• Aker Kvaerner E&C • Division of Aker Kvaerner Canada Inc. • Aker Arctic Technology Inc.	• Feasibility Study Contractor • Lead on mining, process, and infrastructure
• Black and M^{c}Donald	• Shipping studies and port design
• Canarail Consultants Inc.	• Construction logistics and costing
• Clark Builders	• Railway design
• Fednav Ltd. and ENFOTEC	• Construction logistics and costing
• G. H. Wahl & Associates	• Shipping and ice navigation
• HJ O'Connell Construction Ltd.	• Geological database validation, block modelling and resource estimation
• Kivalliq Marine Ltd.	• Construction logistics and costing
• Lassing Dibben Consulting Engineers Ltd.	• Shipping lane bathymetry
• North American Energy Partners Inc. • Peter Kiewit Sons Co. • PND Engineers Inc.	• Material handling – stockpiles, conveyors, rail loading/unloading and ship loading
• ProMet Engineers	• Construction logistics and costing
• Rene Carapetian	• Construction logistics and costing
• Sea Projects Alliance Inc.	• Dock design
• Starkey and Associates	• Metallurgical consulting
• Knight Piésold Ltd.	• Mining and reserve estimation
• Brubacher Development Strategies Inc.	• Shipping logistics
• Coastal and Ocean Resources Inc.	• Metallurgical Consulting
• EBA Engineering Consultants Ltd. • LGL Ltd. • Points West Heritage Consulting Ltd. • RWDI Air Inc. • Fednav Ltd. and Enfotec Technical Services Ltd.	• Environmental and Geotechnical Consultant • Lead on geotechnical engineering, Inuit knowledge, socio-economic and environmental studies, and regulatory approvals
• Studien Gesellschaft fur Eisenerz-Aufbereitung (SGA)	• Socio-economics
	• Shoreline sensitivity mapping/oceanography
	• Geotechnical/permafrost engineering
	• Marine and freshwater fisheries
	• Marine mammals
	• Archaeology
	• Air and noise modelling and monitoring
	• Shipping and ice navigation
	• Metallurgical testwork

1.4.1 Exploration and Resource Evaluation

Baffinland resumed mineral exploration activities in 2004 after a 40-year hiatus in activity at Mary River. After gaining the appropriate authorizations to proceed from NIRB and the applicable authorizing agencies, a new camp was established at Mary River, temporary facilities were

authorized at Milne inlet for receiving materials and supplies, equipment was delivered and offloaded at Milne Inlet on sealifts and moved in to site over winter road, and exploration drilling on Deposit No. 1 was recommenced. Subsequent exploration programs have also been authorized for Deposit Nos. 2, 3 and 4. These exploration drilling programs and additional metallurgical testwork have continued through 2007 and are currently ongoing.

The results of these drilling campaigns were evaluated in a scoping study by Aker Kvaerner E&C, a division of Aker Kvaerner Canada Inc. (Aker Kvaerner) in 2006. The favourable scoping study results led Baffinland to further commission Aker Kvaerner to carry out a definitive feasibility study (DFS) on the Deposit No. 1 resource, commencing in late 2006. On February 19, 2008, Baffinland announced the results of the DFS on Deposit No. 1 as having exceedingly robust economics. The currently estimated mineable reserve in Deposit No. 1 is 365 Mt, (gross) grading about 65% iron.

Concurrent with those exploration activities, Baffinland has also been undertaking preliminary geotechnical, environmental and social data collection programs that have been ongoing since 2004. These programs have focused on such elements as ground conditions, soils and vegetation, water quality and quantity, sediment and fisheries, terrestrial and marine mammals, birds, meteorology and hydrology, archaeology, community social and economic conditions, and traditional knowledge of the Inuit in the area.

Current Project activities are subject to the terms and conditions of the authorizations listed in Table 1.4. Amendment applications to the above authorizations were submitted to the respective agencies in late 2007 to allow for additional exploration drilling and completion of a new drill camp along the proposed rail alignment (between the Mary River site and Cockburn Lake) and an expanded Steensby Inlet camp to support the current exploration and geotechnical drilling activities. The amendment applications were screened by NIRB, and the QIA consulted with the Community Lands and Resource Committees (CLARCs) in each of the five North Baffin communities of Arctic Bay, Clyde River, Hall Beach, Igloolik and Pond Inlet. NIRB issued its screening decision report in late February 2008 indicating that the drilling program amendments may proceed without review, and amendments to existing water license and land use permits have been issued by the NWB and INAC respectively.

1.4.2 Bulk Sampling

Aker Kvaerner's scoping study (2006) suggested the presence of a world-class high-grade iron ore deposit at Mary River. Among the recommendations for moving the Project forward was the completion of a bulk sampling program that would supply ore samples to the European iron and steel marketplace that would help demonstrate the quality and demand for the Mary River product. Baffinland submitted a screening document for the collection of this bulk sample at the end of 2006.

The bulk sampling program was approved to proceed by NIRB at the conclusion of an environmental screening in May 2007. Key elements of the program include:

- Development and operation of temporary lay-down areas, stockpiles, camps, bulk fuel storage facilities, and other support facilities at Milne Inlet

- Site development, camp expansion, modification to water supply and waste disposal facilities, and bulk fuel storage at Mary River
- Upgrade of the Milne Inlet Tote Road to all-weather capabilities
- Excavation, crushing, screening and loading of approximately 250,000 tonnes of iron ore from Deposit No. 1
- Truck haulage of the sample ore along the Milne Inlet Tote Road to the beach at Milne Inlet
- Loading of 5 shiploads in Milne Inlet via a tug and barge system fed by a conveyor arrangement mounted on a floating spud barge dock, for shipment to Europe
- Site decommissioning and removal of crossings in fish habitat and navigable waters on the Tote Road, returning it to a winter-only access road

Baffinland is proceeding with the sampling effort during the winter season of 2007-2008. In many respects, the bulk sampling program affords an excellent opportunity to collect additional data in areas including fugitive dust generation, point source emissions to air and water, and the effects of mining activities on the behaviour of wildlife in the area and the effects of ship traffic on marine mammals. Baffinland and its consultants are taking advantage of this data collection opportunity and will integrate the findings into the impact assessment process.

1.5 EXISTING FACILITIES AND IMPROVEMENTS

Figures 1.2 to 1.4 show the general locations of existing Project components, including:

- The iron ore deposits and current facility locations at Mary River
- The existing temporary development area at Milne Inlet
- The existing Milne Inlet Tote Road between Milne Inlet and the Mary River site
- The proposed railway alignment between the Mary River site and the port location at Steensby Inlet

Both NIRB and the Nunavut Planning Commission (NPC) require GIS (geographic information system) shape files to be provided for projects being proposed in Nunavut. These shape files for the Project areas are included in electronic form in Appendix A.

1.5.1 Mary River Area

Baffinland has been operating camps and related facilities at Mary River since 2004. The existing 100 person seasonally operated camp established at Mary River was expanded in early 2008 with the installation of an all season 100 person camp contemplated as part of the bulk sample program.. Potable water is supplied to the camp from Camp Lake and sanitary wastes are managed with a package sewage treatment plant and polishing/waste stabilization pond. Fuel for aircraft, drilling equipment, and light vehicles is also stored on site in appropriate facilities with bunded and lined containment. Existing facilities and improvements at the Mary River site are shown on Figure 1.3.

Exploration drilling has been ongoing since 2004 with most drill moves and local transportation conducted by helicopters. Short-haul ground transportation is accomplished using light ATVs in the summertime and snowmobiles in the wintertime. Most field programs are cut back during the

wintertime due to the extreme cold and darkness; current bulk sampling activities underway during the winter of 2007-2008 represent the first year-round operations for the Project.

Access to the Mary River site is by fixed wing aircraft using a gravel airstrip (Figure 1.3). Access is also available by float or ski plane on nearby lakes. Baffinland currently operates a regular charter service to the site to move personnel and supplies.

1.5.2 Milne Inlet Area

Milne Inlet, the closest marine access and the one that is being used to support the exploration and bulk sampling activities, is located approximately 100 km to the northwest of Mary River. Milne Inlet has been used since 2004 to deliver materials and equipment by sealift through use of lightering barges landed on the beach area. Baffinland has upgraded an existing airstrip, and a trailer camp designed for peak accommodations of approximately 60 people has been installed. Bulk fuel storage and laydown areas have also been established at Milne Inlet. These facilities are shown on Figure 1.4.

The Milne Inlet Tote Road is an existing road connecting the Mary River site to Milne Inlet that was established during exploration activities in the 1960s. It is designated as a public access easement for the purpose of transportation between Milne Inlet and Mary River in Schedule 21-2 of the Nunavut Land Claims Agreement. The road is currently being upgraded to a temporary all-weather condition to support the transportation of the bulk sample ore from Mary River to the Milne Inlet beach in the winter of 2007-2008.

1.5.3 Steensby Inlet Area

Steensby Inlet, located about 140 km south-southeast of Mary River, provides a navigable access route that is being proposed as the port site from which Mary River ore will be exported. There is currently no transportation route or port facility available for use through this entry; all access to this site has, to date, been by helicopter. An existing 12-person temporary camp has been established which will be expanded to accommodate approximately 40 persons to support additional geotechnical drilling efforts in 2008. A 40 person drill camp will also be constructed in the spring of 2008 approximately mid-way along the proposed rail alignment, to facilitate geotechnical drilling for railway design (Figure 1.2).

1.6 THE PROPOSED PROJECT

The remaining sections of this document describe how Baffinland plans to construct, operate and close the Mary River Project in conformance with Nunavut and Canadian laws and regulations and to the benefit of the region and Canada. The purpose of the Project is to extract, crush and screen (no processing), and ship iron ore to steel mills overseas in an environmentally and socially sustainable manner, while sustaining a competitive rate of return to the Company's investors and lenders, and sharing Project benefits directly with the local Inuit communities.

There is a three-fold need for this project:

1. The current and reasonably foreseeable international demand for iron ore has created market conditions that Baffinland believes are favourable for building a mine at Mary River to supply high-quality iron ore to the international marketplace.

2. It is a stated Government of Nunavut objective to proactively promote exploration and mining as a driver of economic development in Nunavut. Responsible mining development at Mary River will meet these stated objectives of the Nunavut Government.

3. There is an important need for the development of infrastructure, skills training, employment, and business opportunities in Nunavut, as outlined in the Nunavut Exploration and Mining Strategy (Government of Nunavut, 2007). Given the demand for iron ore in the global marketplace, the Mary River Project has the potential, through its mineral exploration and mining activities, to contribute to meeting Nunavummiut needs for infrastructure, training, and sustainable economic development. The Project will generate benefits to both local Inuit communities through capacity-building, employment and business opportunities, and revenues to the Territorial and Federal governments in the form of tax revenues. The Inuit Impact and Benefits Agreement (IIBA), currently under negotiation between Baffinland and the regional Inuit association, will ensure that benefits from the Project flow to affected Inuit communities and the Qikiqtani Region of Nunavut.

The proposed Project envisages an 18 Mt/a production rate over a 21 year mine life. This production rate yields robust economics for the Project as stated in Baffinland's February 19, 2008 press release. Further, industry projections suggest that iron ore demand levels will remain sufficiently strong to allow a favourable return on investment early in the Project life under current market conditions. Market demand for raw materials imposed by the industrialization of countries like China and India make the current demand appear far more sustainable for longer periods of time, in comparison with previous cycles. Baffinland has commissioned Aker Kvaerner to proceed with another scoping study to assess the economics of expanding the output to 30 Mt/a by combining the resources delineated in Deposit Nos. 1, 2, and 3.

SECTION 2.0 - PROJECT DESCRIPTION - PRE-CONSTRUCTION STAGING

The construction and operation of major capital projects in the arctic requires significant up-front planning to address the short summer season and challenging logistics. Initial scheduling must consider the short open water periods for strategic material and supply deliveries for early works and also the activity-limiting extreme cold and darkness during the winter months until all-season facilities can be constructed and brought on-line. To facilitate this, Baffinland plans to pre-deliver in 2009 much of the materials and supplies required for the early construction works during the open water season using conventional arctic sealifts as employed to date by the Project and Nunavut communities. Sealifts carrying materials and supplies will be delivered to Milne Inlet, where they will be offloaded onto the beach and moved to Mary River via the Milne Inlet Tote Road during the winter of 2009-2010. At Milne Inlet and Mary River, existing laydown areas and facilities will be used. New laydown areas will be established at Steensby Inlet in locations and with areas contemplated as shown on Figure 2.1. The materials and supplies brought to Steensby Inlet will be offloaded and placed into new laydown areas that are within the planned footprint of the proposed new port facility. In addition to the sealifts, two barge mounted camps or ship(s), and 20,000 L capacity bunded (with secondary containment) fuel iso-containers or a fuel tanker or barge, will be pre-positioned to overwinter in Steensby Inlet so that construction can be initiated in mid-2010, pending regulatory approval (Section 1.3.4).

Supplemental information describing the pre-construction activities and proposed mitigation and monitoring is included in Appendix F. The document explains Baffinland's specific plans for developing and operating the pre-construction staging areas.

Pre-construction staging is expected to be authorized prior to the completion of the Project review by NIRB. Article 12.10.2(b) gives NIRB the expressed authority to approve or issue licenses for certain exploration or development activities related to the Project if, in their judgment, it is appropriate to allow the activity to proceed prior to completion of the full review. Baffinland will apply to NIRB, pursuant to Article 12.10.2(b), to allow pre-construction staging to take place in 2009. Baffinland's development schedule presumes that this exemption will be obtained.

The main milestone dates of the pre-construction staging are summarised below.

Date	Activity
March 2008	Submit Baffinland Project Development Proposal and supplemental information for the Pre-Construction Staging
June 2008	NIRB issues exemption authorizing pre-construction staging to proceed; INAC completes CEAA screening; INAC and QIA issue associated land use approvals
June 2008	Baffinland orders equipment
August - early October 2009	Ships arrive to Milne Inlet and Steensby Inlet
Winter 2009/2010	Baffinland transports fuel and camp facilities from Milne Inlet to Mary River along the winter road
April 2010	NIRB issues Project Certificate authorizing start of construction

Pre-construction staging will be discussed with local communities during upcoming public meetings planned for the spring of 2008.

SECTION 3.0 - PROJECT DESCRIPTION - CONSTRUCTION PHASE

3.1 OVERALL CONSTRUCTION STRATEGY

Assuming the pre-positioning of equipment and materials as described in Section 2, the construction phase of the Project is expected to be carried out over a 4 year period. Railway construction is the critical path item for the construction phase, and as such, it will be necessary to establish a construction access road and then concurrently build the railway from a number of construction faces. Construction activities for the Steensby port and the railway will be staged from the Steensby port site, and construction activities for Mary River will be staged from Milne Inlet.

Infrastructure such as camps and laydown areas, as well as aggregate sources from rock quarries and sand and gravel borrow areas, is required to support construction. Where possible, permanent support infrastructure will be built at the onset of construction, to be used during both construction and operation phases of the Project. In many instances, temporary infrastructure will be constructed or positioned at Project sites for the duration of the construction phase only. This temporary infrastructure will to be removed once construction is complete. Major components in each area are presented below, with temporary infrastructure distinguished from permanent facilities. Site layouts during construction for Mary River, Steensby Inlet, and the railway alignment are shown on Figures 3.1, 3.2 and 3.3, respectively.

Mary River Mine Site	
Temporary Facilities	**Permanent Facilities**
o Construction camp	o Ore crushing and screening facilities
o Contractor offices	o Ore stockpiling facilities
o Quarry and borrow sites, and related access roads	o Railway loading and unloading facilities
	o Permanent worker accommodations
o Temporary fuel storage (iso-containers and manufactured tanks)	o Communication systems
	o Site roads
o Aggregate crusher and stockpiles	o Heavy equipment fleet parking
o Concrete batching plants	o Laydown areas
o Power generators	o Airstrip (existing and upgraded)
o Portable lighting plants	o Bulk fuel storage and distribution facilities
o Construction workshops and maintenance shops	o Explosive manufacturing and storage
	o Water supply
o Warehouses/stores	o Power generation
o Equipment maintenance facilities	o Waste management facilities
	o Explosives plant (used during construction)

It is expected that construction will be accomplished by several major construction companies working on various aspects of the Project. The expected workforce composition and numbers are presented in Section 5.1. Construction activities are scheduled to commence in 2010, immediately following receipt of the required regulatory approvals (Section 1.3.4), and will take place concurrently at both areas. The railway construction schedule is the critical path and is based on the timely delivery of pre-construction materials to both work faces at Mary River (via Milne Inlet) and Steensby Inlet.

Milne Inlet and Milne Inlet Tote Road	
Temporary Facilities	**Permanent Facilities**
o Temporary floating dock for sealift unloading	o Milne Inlet Tote Road (existing and upgraded)
o Bulk fuel storage facilities (existing and new)	o Laydown areas (existing)
o Camp facilities (existing)	o Airstrip (existing and upgraded)
o Communication systems	o Bulk fuel storage
o Water supply	o Waste management
o Power generation	o Quarries and borrow sources (existing)

Railway from Mary River to Steensby Inlet	
Temporary Facilities	**Permanent Facilities**
o Construction access roads	o Railway embankment
o Quarries and borrow sources	o Train loading and unloading facilities
o Construction camps (2 to 4)	o Communication systems
o Refuelling depots at camps	o Tunnels, bridges
o Explosives magazines	o Rail sidings

Steensby Inlet Port Site	
Temporary Facilities	**Permanent Facilities**
o Construction docks	o Ore stockpiling facilities
o Quarry and borrow sites, and related access roads	o Ore, freight and tug docks
	o Ship loading and unloading facilities
o Concrete batch plant(s)	o Cargo (container) handling facilities
o Construction workshops and maintenance shops	o Permanent worker accommodations
	o Rail shops and maintenance infrastructure
o Warehouses/stores	o Buildings and offices
o Temporary power generators	o Communication systems
o Portable lighting plants	o Site roads
o Laydown areas/freight storage	o Causeway
o Parking areas for construction fleet	o Laydown areas/freight storage
o Temporary fuel storage (iso-containers)	o Airstrip and related access road
o Equipment maintenance facilities	o Bulk fuel storage and distribution facilities
o Explosives plant and magazines	o Water supply facilities
	o Waste management facilities
	o Power plant
	o Navigational aids (shipping lane and port)

3.1.1 Mobilization and Re-Supply

During construction, containerized equipment and materials will be shipped to either Milne Inlet or Steensby Inlet. Personnel, equipment and materials will also be flown into the Mary River, Steensby Inlet and Milne Inlet airstrips. Items bound for the Mary River mine will be shipped to Milne Inlet during open water (August to early October) and then transported over the Milne Inlet Tote Road to the Mary River site during winter conditions. A spud barge arrangement will be anchored at the Milne Inlet beach in 2010 to handle cargo transfer for the Mary River site; ships at Steensby Inlet will be off-loaded using a rough terrain container handler or similar equipment. Existing camp facilities and laydown areas will be used for construction to the extent practical.

The following table presents the estimated number of ships arriving at Mary River and at Steensby Inlet each year during construction, as well as the total tonnage of materials to be delivered each year. The estimated number of voyages each year is based on use of conventional sealift ships, of around 7,000 to 16,000 DWT capacity, but larger ships or barges could be used depending on cost and availability.

Shipping Traffic during Construction

Location	Estimated Maritime Transportation	2010	2011	2012	2013	2014
Milne Inlet	**Vessels**	**12**	**3**	**4**	**3**	**4**
	Total Revenue Tons	105,000	30,000	43,000	30,000	33,000
	Fuel (tankers or barges)	**3**	**2**	**1**	**2**	**0**
	Total Fuel Volume (ML)	21.3	13.3	8.8	15.7	0
Steensby Inlet	**Vessels**	**15**	**11**	**8**	**4**	**3**
	Total Revenue Tons	138,000	100,000	75,000	30,000	30,000
	Fuel (tankers or barges)	**2**	**3**	**2**	**5**	**1**
	Total Fuel Volume (ML)	28.1	25.8	11.4	45.8	1

As the preceding table shows, the 2010 sealift will require the largest volume of marine traffic in the Project's construction period, with an estimated 27 vessels delivering supplies to Milne Inlet and Steensby Inlet. This volume is nearly double that of the next highest-traffic year, in 2011, and reinforces the need for advance staging of materials during the previous summer (Section 2). Fuel tankers and/or barges destined to Milne Inlet and Steensby Inlet in 2010 will berth over winter as bulk fuel storage facilities will have yet to have been constructed.

In 2011, the land-based permanent fuel tank farm constructed at Steensby Inlet will receive fuel deliveries. The existing bladder tank farm at Milne Inlet will continue to be utilized and a steel tank farm will be constructed for additional capacity. A fuel tanker may also berth over winter at Milne

Inlet. Sealifts in 2013, 2014 and 2015 are primarily for demobilizing equipment as the construction activity winds down.

A considerable fleet of equipment is required to construct the Project. While in no way a complete list, the following provides a flavour for the types and numbers of key heavy equipment involved in construction:

Approximation of the Heavy Equipment Fleet Used in Construction	
Pick-up Trucks (156)	Portable Generators (120)
Excavators (50)	Dozers (40)
Haul Trucks (20)	Loaders (5)
Drills (30)	Crushers (8)
Water trucks (6)	Miscellaneous work trucks (50)
Grader (12)	Fuel tankers (3)
Transport trucks (25)	Cranes (12)

3.1.2 Anticipated Construction Milestones

Key Project component milestones are scheduled for the following years:

- 2008
  - Exemption authorizing pre-construction staging (Section 2) is issued
- 2009
  - Stage equipment, materials, fuel and barge accommodation (August through October)
- 2010
  - Project Certificate authorizing the Project to proceed is issued in April; permits follow
  - Initiate construction following receipt of permits
  - Build Steensby airstrip
  - Commence construction of access road and railway
  - Prepare sites and develop borrow sources
  - Initiate upgrades to Milne Inlet Tote Road for oversized equipment
  - Build construction support facilities and fuel storage tanks at Milne Inlet, Mary River and Steensby Inlet
  - Construct freight and tug docks at Steensby, and spud barge arrangement at Milne Inlet
- 2011
  - All site preparation and temporary construction facilities will be in place; civil works on foundations begin
  - Construction access road for railway will be completed from Steensby Inlet to Mary River
  - Tank farms at Steensby Inlet and Mary River are completed and receive fuel delivery
- 2012
  - Main project components (mine site, railway and port) are under construction

- 2013
  - Railway construction is completed; other construction is substantially complete
  - Ore dock is completed
  - Mine commissioning starts in the fourth quarter with pre-production mining
- 2014
  - Railway will begin operation and start haulage at reduced loads, creating an ore stockpile at the Steensby Inlet port
  - Full production begins at the beginning of second quarter
- 2015
  - Demobilization of construction equipment, and reclamation of temporary areas for construction (i.e., quarries, construction access road) will likely span the first couple of years of operation

3.1.3 Ongoing Geotechnical Investigations

Geotechnical investigations have been ongoing for the past several years at the mine site, Steensby port site, and along the railway. It will be necessary to continue geotechnical investigations through the regulatory phase, and early in the construction phase as an integral element of Project execution.

3.2 MILNE INLET AND MARY RIVER

Mine construction at Mary River will be facilitated by moving equipment and materials over the Milne Inlet Tote Road during winter. With the exception of bulk fuel storage capacity, the existing facilities at Milne Inlet, shown on Figure 1.4, are sufficient to support mine construction, and will remain through the construction phase to receive sealift materials. This includes the existing trailer camp designed for a peak capacity of approximately 60 people, and the existing 8 ML bladder tank farm. Materials will have been delivered to Milne Inlet during 2009 staging activities, with materials brought over the winter road to Mary River. In 2010, a spud barge arrangement (Prudoe Bay style barges) will be anchored at the Milne Inlet beach at the location at the beach used for bulk sampling activities in 2007 and 2008. The dock will be of sufficient length to extend into the deep water so that the sealift ships may berth into it, so that lightering barges are not necessary to unload the ships anchored at distance. The dock will be in place for the duration of the construction phase only.

The Milne Inlet Tote Road will be used as a winter road during the construction phase. It will be necessary during 2010 and/or 2011 to conduct additional upgrades to the road so that oversized mine equipment (i.e., stacker/reclaimers, open pit shovels, 210 t mine trucks) may be brought into site near the end of construction. The current road upgrades for the bulk sampling program, while sufficient for transporting the ore sample in 45 t trucks, will not meet the requirements to bring in oversized equipment. Sharp turns, steep hills, and narrow roadways adjacent watercourses present barriers for the large oversized equipment. Ground work in 2008 will identify needed upgrades to the road.

3.2.1 Site Preparation Activities

The existing infrastructure at Mary River at the onset of construction will include (Figure 3.1):

- An existing 200 person camp for exploration, geotechnical and environmental personnel
- An existing airstrip with temporary airstrip lighting, adequate for small aircraft year-round and larger aircraft (i.e., Hercules) when the ground is frozen
- Laydown areas
- Fuel storage areas in bladder tank farms, totalling approximately 2 ML

Site preparation activities at the Mary River site will include:

- Upgrade the airstrip to accommodate Boeing 737s and similar sized aircraft
- Prepare any additional laydown areas or work areas
- Construct temporary accommodations
- Construct a concrete batch plant at Mary River
- Construct access roads to Project infrastructure areas
- Develop existing aggregate sources for rock, sand and gravel

Construction activities will utilize existing Project infrastructure as much as possible to decrease the land disturbance area and improve efficiency of construction activities. At Milne Inlet, existing laydown areas will be supplemented with additional laydown area within the existing lease boundaries that have been assessed by an archaeologist. Additional laydown and camp space will be established at Mary River along the existing road where ground conditions will support laydown areas and temporary camps with little to no additional grading or fill required. These areas have been assessed by a qualified archaeologist.

3.2.2 Construction Camps and Related Facilities

The current 200 person capacity camp at Mary River, constructed for the bulk sampling program, will be insufficient to house the construction crew, as exploration, geotechnical drilling, and environmental programs will be ongoing (Section 1.5.1). A temporary trailer or Weatherhaven-style construction camp, mobilized to the Mary River site during 2009 staging activities, will be constructed as soon as possible in 2010. The workforce at Mary River, including personnel supporting ongoing exploration, geotechnical and environmental programs is expected to peak at approximately 1,000 people.

Potable water will be obtained from Camp Lake, which is the current water supply and is relatively removed from Project activities. Sewage will be treated by a package sewage treatment plant likely in combination with a lagoon, with Sheardown Lake being the proposed receiving waterbody.

Waste management facilities required for the operation phase will be installed early in the construction (Section 4.1.3). Waste will be managed in the following manner:

- Temporary storage and off-site shipping of hazardous and recyclable waste materials
- Incineration of non-hazardous combustible wastes
- Landfilling of inert non-combustible wastes

Larger or additional incinerators will be brought on-line to meet the Project's needs during the construction phase, and the existing landfill created for the bulk sampling program will be expanded during construction. Incineration will be the main disposal method for combustible wastes generated on-site, which should eliminate problems associated with odours attracting wildlife, or the creation of gases through the decomposition of putrescible materials. The landfill site will be used to dispose of only inert solid waste and ashes from the incinerator. Cover will be applied as part of regular landfill operation.

Hazardous wastes that will be generated on-site will be similar to those generated during the operation phase (Section 4.1.3.6). Hazardous wastes will be temporarily stored in special containers and/or at designated locations on-site and will be respectively shipped to registered hazardous waste disposal facilities or to recycling depots.

3.2.3 Quarries and Borrow Sources

Quarry materials, including rock, sand, and gravel, will be required for additional upgrades to the Milne Inlet Tote Road and for construction at Mary River. Table 3.1 lists the aggregate sources identified for the Project, their location, and estimated in-situ volume requirements. Three large borrow areas and two rock quarries identified for the bulk sampling program (Figure 1.2) will be the primary source of material. These existing sites, along with borrow from within the tote road right-of-way are permitted under Baffinland's existing commercial lease and quarry concessions with the QIA for Inuit-owned land, which will be amended or a new lease issued for Project development.

3.2.4 Explosives

The permanent mixing plant to support mining during operation at Mary River will be built early in construction, and in the interim temporary explosives magazines will be used. Magazines will be provided for explosives and detonators for both the construction and operation phases.

3.3 STEENSBY INLET PORT AND RAILWAY

Construction at Steensby port and the railway will be facilitated by pre-positioning equipment, fuel, floating accommodations and materials at Steensby Inlet in 2009 (Section 2). Establishment of the access road and the airstrip is important to facilitate larger movements of workers, and construction of bulk fuel storage will be necessary to provide on-land fuel storage capabilities and phase out the need for fuel tankers or barges to be anchored nearby. The layout at the Steensby port site during construction is shown on Figure 3.2. The railway will be constructed from Steensby Inlet by first building the construction access road, then establishing construction camps to facilitate construction of the railway from multiple faces. The location of proposed quarries, construction camps and the construction access road is shown on Figure 3.3. The construction access road will also provide a means to truck fuel to Mary River to re-supply the new bulk fuel

storage facility constructed at that location in 2011, thereby eliminating the need for overwintering fuel tankers or barges at Milne Inlet beyond 2009-2010.

3.3.1 Site Preparation Activities

Site preparation activities at Steensby Inlet will include (Figure 3.2):

- Prepare any additional laydown areas or work areas
- Develop the airstrip and the access road from the port site to the airstrip
- Commission temporary personnel accommodations
- Construct the railway access road
- Establish construction docks on the island and mainland
- Establish railway construction camps
- Construct a concrete batch plant at Steensby Inlet

Site preparation activities at Steensby Inlet will be supported by additional archaeological surveys and potentially mitigation (if warranted) for proposed development areas.

Construction of the bulk fuel storage tanks will begin, and the construction access road along the railway alignment will be constructed to facilitate railway construction and in particular two tunnels along Cockburn Lake which require considerable time to construct (Section 4.3.3).

Construction of the port will proceed with construction of permanent infrastructure including the ore, freight and tug docks, which will necessitate underwater blasting (see conceptual drawings in Appendix F7). An evaluation of dock construction alternatives is ongoing, to determine opportunities of constructing the docks with less blasting, without compromising the robust construction required to support year-round shipping in landfast ice. Bathymetric work in 2007 identified at least two localized shallow points on the shipping approach and exit, and blasting may be required to clear these locations (Figure 3.4). Additional bathymetric and geotechnical work in 2008 will confirm the substrate at these locations and whether or not blasting will be required. Dredged material will likely be disposed of on land and not at sea.

3.3.2 Construction Camps and Related Facilities

Construction personnel will be housed in two 225 person capacity floating barge mounted accommodations or ships stationed at Steensby Inlet to facilitate construction at the port, if possible. This approach would eliminate the need to construct large temporary camps on land at the port site. Two main construction camps will be established along the railway alignment, one near the major crossing of Cockburn Lake and the other north of Cockburn Lake mid-way to Ravn River. These camps will have an occupancy ranging in the order of 100 to 150 people. Consideration is being given to locating two smaller construction camps at key bridge locations. Water will be supplied from nearby lakes for the construction camps. The accommodation barges or ships at Steensby Inlet will likely be supplied potable water using an on-board desalination plant. Waste water will be treated using package sewage treatment plants or, for the smaller camps, using incinerating toilets or similar. Incinerators will be provided at each location to manage combustible non-hazardous

wastes (most importantly food wastes) with all other non-hazardous wastes stored for disposal in the landfill at Mary River. Hazardous wastes generated with railway and port construction will be stored at the port site and taken offsite by sealift to licensed disposal facilities in the south.

3.3.3 Quarries and Borrow Sources

Quarry materials, including rock, sand, and gravel, will be required for construction of the Steensby port and at the Steensby airstrip, as well as the railway. Table 3.1 lists aggregate sources, their location, and estimated in-situ volume requirements. Limited sand and gravel deposits along the railway and at Steensby Inlet require that the majority of fill material be derived from quarried rock.

The majority of rock material for the railway embankment and railway construction access road base will be generated from crushed and screened cut-and-fill within the footprint of the alignments. Additional aggregate, in the order of 5 million cubic metres, is estimated to be required beyond what will be derived from rail and road cuts. The aggregate sources listed in Table 3.1 are shown on Figure 3.2 and in greater detail in the railway alignment drawings in Appendix F1. The fill material required for the Steensby airstrip will be derived from local quarries between the airstrip and the port. Limited sampling of the rock material, including geochemical testing, has been completed on a portion of the identified rock quarries, and additional investigations will be conducted in 2008 to define which quarries have suitable materials and to refine volume estimates. The current volume calculations provided in Table 3.1 are based on the assumption that only one-third of the identified sites will be used, and therefore the estimated volumes for each are conservative.

A quarry and a borrow source will be required after construction for railway maintenance through the life of the Project. At present, rock quarry BAL-1A has been identified for ballast material, and one of either BR-4, BR-5 or BOR 3/3A have been identified to remain open throughout operation as borrow pits. The 2008 field program will confirm the permanent quarry and borrow locations.

3.3.4 Explosives

The mixing plant at Steensby Inlet will be a temporary structure that will be dismantled following the completion of construction activities. Temporary magazines will be positioned at Steensby Inlet, and day-use magazines will be located along the railway throughout the construction phase.

3.4 CONCURRENT EXPLORATION ACTIVITIES

Geological exploration is expected to continue throughout construction and over the life of the mine. Exploration activities are currently ongoing at Deposit Nos. 1, 2 and 3/3B, and are scheduled to begin in the near future at Deposit No. 4. Exploration activities for Deposit Nos. 1, 2 and 3/3B will continue to be based from the Mary River site; exploration activities at Deposit No. 4 will be based from a small camp near the deposit, approximately 27 km from Mary River, for which Baffinland obtained approval in 2007. Exploration activities beyond 2010 have not been developed. Environmental monitoring programs will also continue.

SECTION 4.0 - PROJECT DESCRIPTION – OPERATION PHASE

4.1 MINE SITE

4.1.1 Mine Site Layout

During operations the Mary River mine site will consist of:

- Open pit mine and related facilities:
  - Mine haulage roads
  - Run of mine (ROM) ore stockpile
  - Ore stockpiles (lump and fines) including stacker/reclaimer system
  - Primary crusher
  - Secondary crushing and screening
  - Explosives magazines and emulsion plant
  - Waste rock dumps
- Mine site support facilities:
  - Power generating station
  - Main office, service, administration and accommodation buildings including existing exploration camp
  - Warehouse and storage yard
  - Communications system
  - Drill hole core storage
  - Geological and environmental laboratories
  - Maintenance shop mine, equipment ready line and mine office
  - Water treatment system
  - Wastewater treatment system
  - Mine water treatment system
  - Bulk fuel storage facilities
  - Incinerator
  - Landfill
  - Airstrip
  - Site roads and parking
  - Railway line terminus and loading facilities

A plan view of the mine site facilities is shown on Figure 4.1. The siting considerations for the mine site have included:

- Limit environmental impact by reducing the overall footprint
- Provide a safe working facility
- Minimize earthworks
- Minimize mining haul distances
- Provide efficient heat recovery from power plants
- Provide attractive and effective living accommodation for employees
- Reduce the distance between the accommodation area and work areas to the maximum practical extent

As is typical for work in permafrost areas, the mine site building foundations will, where possible, be sited on bedrock. Alternatively, a variety of different pile systems will be utilized in combination with elevated building designs. Surface pads consisting of locally quarried crushed rock (gravel) will be required to provide access, laydown areas, parking areas, raising of grade, and generally to protect the permafrost around all of the permanent infrastructure facilities.

Careful consideration was given to the choice and location of ancillary facilities including the incinerator, landfill, water treatment, wastewater treatment, ammonium nitrate storage, explosives mixing and explosive magazines. Most of these facilities will be housed in buildings, and some, such as the explosives storage areas, will be remotely located from other permanent workplace facilities for reasons of health, safety and compliance with government regulations.

Geotechnical and exploration drilling are ongoing and the results from these activities may influence the positioning of site infrastructure. Additional geotechnical drilling could identify important geotechnical constraints. Ongoing drilling of Deposit No. 1 could result in changes to the pit configuration and therefore volumes and positioning of related waste rock stockpiles, explosives storage, conveyor systems, maintenance shops, access roads, and the primary crusher. While minor changes to facility location may occur as engineering designs continue to be refined, the general positioning of the Project components with respect to watersheds and other environmental boundaries are unlikely to change.

4.1.2 Mining Operations

Mining operations will require drilling and blasting within an open pit, loading of ore into mine haul trucks, delivery of the ore to a series of crushers and screens, movement (conveying) of the ore by conveyors to a stacker/stockpile, and reclaiming of the stockpile for loading into railway cars. The various steps of mining are described below.

4.1.2.1 Open Pit

The open pit will be excavated using a conventional bench configuration with access via ramps. Movement of vehicles within the pit will be monitored by a central dispatching system in order to ensure worker health and safety and operational efficiency.

The general dimensions of the final open pit based on the preliminary design presented in the DFS will be:

- Maximum length: 2.0 km
- Maximum width: 1.2 km
- Depth ranging from 465 m (northern side) to 195 m (southern side)

Geotechnical investigations have included the drilling of a 400 m deep drillhole that was instrumented with thermistors along its length. The thermistors report ground temperatures at various depths within the hole. Extrapolation of temperature gradients with depth suggests that permafrost conditions (i.e., below zero degrees Celsius for two consecutive years) extend to

approximately 700 m, well below the planned mine depths. As such, water inflows into the pit are expected to be minor, consisting of shallow seasonal groundwater flows and direct contribution from precipitation events.

4.1.2.2 Explosives Storage and Blasting

Blasting at the Mary River open pit will be carried out using ammonium nitrate and fuel oil emulsion product manufactured on site. Explosives magazines will be located on site for storage of ammonium nitrate and blasting accessories in accordance with the appropriate regulations governing storage of such materials.

The explosives facility will include:

- Bulk ammonium nitrate outdoor storage area
- Bulk fuel area
- Magazine for storage of detonators, detonating cord, boosters etc.
- Emulsion manufacturing facility

The explosives facility will be located to the north of the open pit at some distance from the rest of the mine site, as shown on Figure 3.5, in accordance with the regulatory requirements for safe storage of explosives.

4.1.2.3 Loading and Hauling

Diesel-hydraulic face shovels backed up by front-end loaders will be the primary methods for loading mine haul trucks. Backhoe excavators will also be located on site for general earthworks, snow removal, and limited mining activity where the larger equipment may have limited access. Wheel and track bulldozers will be used for cleanup around mining activities and for control of rock on the benches. Graders and water trucks will be used for main haul road maintenance.

Haul trucks will be used to transport ore to the primary crusher or run-of-mine (ROM) stockpile and waste rock to the waste rock disposal areas. During the later mining stages it is estimated that a fleet of about 20 haul trucks will be used at the site.

Figure 4.2 shows a flow diagram depicting the steps involved in processing the ore after it is hauled from the open pit all the way through to it being loaded onto the ore carriers at the port at Steensby Inlet.

4.1.2.4 Ore Stockpiles

Ore will be stored in a ROM stockpile located near the crusher or fed directly into the primary gyratory crusher. The capacity of this ROM stockpile is expected to be on the order of 400,000 t.

Following secondary crushing and screening, four other temporary ore stockpiles will be used for storing lump ore and fines, with an expected combined total capacity on the order of 1.4 Mt. These stockpiles will be used for ore blending and are located near the railway loading facility.

4.1.2.5 Crushing/Screening Plant

Ore from the open pit or the ROM stockpile will be processed by crushing and screening, to produce lump product and ore fines to specifications required by the steel mills. The primary objective of the crushing systems is to maximize the production of lump product (-30 mm/+6 mm), while at the same time, keeping ore fines (-6 mm) at a minimum, since lump product has a greater value for sale. The processing plant consists of a primary crushing station, a primary screening station, a secondary crushing station, and conveyors the transfer the ore to rail-mounted mobile stacker stockpiles where the sized ore can later be reclaimed and loaded on the rail cars. The location of the crusher system is shown on Figure 4.1. It is noted that no chemicals are added to this process, it is strictly an ore sizing process.

The crushers and screens are installed inside buildings. Material handling equipment, including reclaimers, stackers and conveyors are installed outdoors. Conveyors will be equipped with wind hoods to reduce wind exposure and potential for ore fines to be blown off the conveyors. Dust collectors will be installed at transfer points and other required areas to limit fugitive dust emissions.

4.1.2.6 Waste Rock Stockpiles

Waste rock disposal areas designed for permanent storage of waste rock will be located on the northeast, northwest, west, and southwest sides of the open pit. After completion, the northwest to southwest waste rock stockpile will be joined to form a single waste rock stockpile.

The total capacity of the waste rock stockpiles is expected to be on the order of 220 Mm^3. For the purpose of the DFS, it was assumed that any waste rock classified as potentially acid-generating will be stored in designated areas within the waste rock stockpile to limit its potential for contact with meteoric water and also its exposure to oxidizing conditions.

Waste Rock Management

Potentially Acid Generating Rock

Preliminary material testing to date suggests that the majority of waste rock excavated from the open pit will be environmentally benign i.e. it will not be subject to significant metal leaching, and/or acid generation caused by oxidation of sulphide minerals. Due to its northern location, it is likely that the majority of waste rock area material will be permanently frozen, and that only the upper surficial material will be subject to seasonal freezing and thawing. The frozen material is expected to form an effective barrier for acid forming reactions since no liquid water is available and its solid form will limit the potential for exposure to oxidation.

During mining, monitoring of waste rock will help identify the presence of sulphides. If significant quantities of sulphidic waste rock are identified, then this material may be stored in a designated area of the waste rock stockpiles to limit air and water contact and where runoff from the area can be appropriately managed (see Section 4.1.3.5).

4.1.2.7 Schedule

The current mine life, including the pre-production mining period of 3 months and only 9 months of mining in the final year, is 21 years. Annual mine production is estimated at 18 Mt. The three-month pre-production period will occur during the final 3 months of 2013, when a high-grade ore stockpile will be developed near the crusher. About 13 Mt of ore will be mined, crushed and transported to Steensby Inlet in 2014, and 18 Mt will be mined each year from 2015 through 2032, with 16 Mt mined in the final year of mining (in 2033).

4.1.3 Mine Site Support Facilities

4.1.3.1 Mine Site Buildings

Accommodation Complex

The accommodation building will consist of a prefabricated modular unit supported on pile foundations. The facility will be designed to accommodate approximately 275 people in four 2-storey dormitory wings. A central core area will comprise: kitchen/dining facilities, recreational facilities, and general service space.

Maintenance Complex

The maintenance building which will comprise maintenance, warehousing and administration offices and will be constructed of structural steel with a prefinished metal roof and wall cladding supported on a pile supported foundation. Access to the building will be by man doors, overhead doors, corridors/utilidors and a high multiplex door (for the repairs shops). The complex will be equipped with oil/water separators in areas associated with the steam-cleaning facility.

Assay Laboratory

The assay laboratory will house the metallurgical office and will be used for ore sample storage, preparation and analyses.

4.1.3.2 Power Supply

A centralized power plant designed to service the entire mine site will be located to the east of the accommodation complex. The power plant will be designed to accommodate five diesel generating sets to provide enough capacity to meet the estimated power demands of 15.8 megawatts. Annual energy consumption is estimated at 114,000 megawatt hours. At any one time, three generators will be in operation, one will be on standby, and one will be spare.

The power plant building will be connected to the accommodation complex through an utilidor. To reduce emissions and fuel consumption a built-in closed-circuit, a two-stage waste heat recovery system will be used to recover waste heat from the oil cooler, aftercooler, water jacket and exhaust gas stream. This captured heat will then be used to heat site buildings.

A boiler building will provide a back-up system to supply the required building heat in the event of catastrophic failure of the power plant. The boilers will be sized to supply the entire site demand for building heat for a one week period. The boiler house will be connected to the power plant with a service utilidor for essential piping and electrical wiring.

Baffinland has conducted a pre-feasibility study on alternative energy options to supply power to either or both of the mine site and Steensby port site, focusing on hydro-electricity and wind power. A study of alternative energy options identified a potential hydro-electric site near the Steensby port site (Section 4.4.4.2), and a test wind tower installed at the Mary River site is testing the viability of wind to partially off-set diesel use. While these options do not form part of the Project, Baffinland continues to evaluate these energy options for potential longer-term implementation. Separate approvals would be sought if either hydro-electricity or wind was developed.

Corridors/Utilidors

Elevated corridors/utilidors will connect all buildings in the plant area. Besides providing corridor access for personnel, they will also contain heating services, piping and electrical trays/conduits. The corridors/utilidors will be constructed out of prefabricated modular units, supported on a structural steel framing system and pipe piles.

4.1.3.3 Water Supply

The potable water supply for the mine will be sourced from Camp Lake located about 3 km from the mine site. The potable water supply system will consist of a pump house, an insulated steel raw water pipeline and potable water storage tanks (also used to store fire protection water).

The potable water treatment plant will be located near the accommodation/administration/laboratory complex. Water treatment will consist of chemical treatment followed by settlement, filtration, polishing and chlorine or ultraviolet disinfection. Treated potable water will be stored in an insulated and heat-traced water storage tank sized to meet the requirements of the approximate 275 mine site personnel.

A water truck will deliver potable water for local consumption in remote areas such as the mine maintenance shop/office, explosives handling facility and other ancillary facilities as appropriate.

The fire protection system will include a primary fire pump (and backups) and sprinkler systems for the accommodation, administration, laboratory and warehouse facilities. A dry sprinkler system will be provided for the plant maintenance complex. Fully-equipped hose cabinets will be installed in heated buildings.

4.1.3.4 Wastewater Treatment

The wastewater treatment facility (WWTF) will be located in the vicinity of the accommodation/administration/laboratory complex. It is envisaged that the WWTF will consist of a self-contained extended aeration treatment system. Surplus solids will be dried and then incinerated on site. Ultraviolet disinfection will be used for final polishing of the treated effluent which will then be discharged into Sheardown Lake through an insulated and heat-traced pipeline. The wastewater treatment plant will be designed to achieve a high level of treatment, performance, in-line with those which are typically used by Canadian urban municipalities.

Wastewater will be collected within each building and pumped to the treatment plant via a force main pipe. At remote areas, such as the mine maintenance/mine office, explosives handling facility, wastewater will be collected in local holding tanks and collected via a tanker truck for treatment at the WWTF.

4.1.3.5 Mine Water Management

Due to the arid climate, it is not anticipated that significant volumes of surface runoff will be generated, with the possible exception of during the spring freshet. Current indications are that magnetite (and to a lesser extent haematite) ore may be susceptible to limited metal leaching when exposed to certain conditions. To address this potential issue, the ore stockpile design will provisionally incorporate appropriate runoff collection systems to allow any impacted leachate to be collected and treated, as required. Run-off collection provisions will also be made for the general site area.

At present, the potential issue of precipitation accumulation within the open pit is still being assessed to determine whether pit dewatering will be required during operations. Current indications are that the presence of permafrost will drastically minimize water inflow into the open pit. In the event that pit dewatering is required (albeit on an intermittent basis), the water will be collected in sumps located in the pit. This water will be transferred to trucks for use on the waste rock stockpiles and/or pit roads for dust suppression.

Based on the preliminary hydrologic and geochemical information collected to date, the Mary River Project is not expected to need to actively treat significant quantities of impacted mine water, if at all. However, in the event that such treatment is needed, it is currently anticipated that the mine water treatment system will consist of a storage lagoon and a lime treatment system which will be used intermittently on an as needed basis. Discharge of treated water will occur either to Sheardown Lake or to the Mary River.

4.1.3.6 Waste Management

Handling, storage, transportation and disposal of wastes generated by the Project will be conducted in a safe, efficient and environmentally-compliant manner designed to: i) minimize the risk of adverse environmental impacts, ii) protect the health and safety of site personnel, and iii) minimize wastage and avoid subsequent costly cleanup after mine closure and reclamation. The

fundamental basis of the waste management plan will be to achieve positive management of wastes incorporating the implementation of a sound waste minimization program that will focus upon the principles of:

- Reduction
- Recovery
- Reuse
- Recycling

Waste Sources

A summary of the types of waste that are likely to be generated at the mine site are presented below.

Source and Type of Wastes Generated On-site	
Source	**Waste Materials**
Offices	Computers and electronic wastes, fluorescent lights
Wastewater treatment facility	Biological sludge and treated liquid effluent
Maintenance complex	Used batteries, engine oil, oil filters, tires, scrap metals, etc.
Laboratory	Chemical laboratory wastes and toxic substances
Domestic waste from construction camp and accommodation facility and kitchens/canteens	Biological sludge, garbage, oily and food wastes
Inert waste from construction sites and materials from operations	Wood, plastics, cement, sand, used construction materials, metals, pipes, glass, etc.
Medical waste from first-aid facility	Medical wastes
Open pit	Waste rock (discussed in Section 4.1.2.6)

Some of the materials included in the waste streams are classified as hazardous wastes because of the potential risk to human health and safety, property and the environment. Hazardous wastes that will be generated on-site will include: used oils, solvents and paints, used and/or surplus chemicals and medical wastes, batteries, light bulbs, and smoke detectors.

Wastes remaining after application of the waste minimization techniques will be treated and disposed of in a practical and environmentally- responsible manner. The following methods will be applied at the site:

- Temporary storage and off-site shipping of hazardous and recyclable waste materials
- Incineration of non-hazardous combustible wastes
- Landfilling of inert non-combustible wastes

Waste disposal methods are discussed below.

Waste Disposal

Incineration

The main disposal method for combustible wastes generated on-site will be incineration. This method will eliminate problems associated with odours attracting wildlife, or the creation of poisonous or flammable gases through the decomposition of putrescible materials. Ashes from the incineration process will be transported in closed drums by covered truck and buried within a designated area of the landfill. Only trained personnel will operate the incinerator(s).

Landfill

The landfill site will be used to dispose of only inert solid waste and ashes from the incinerator. An operation and maintenance plan for the landfill will guide operations. Regular cover will be applied, and a cap of native overburden will be placed on top of the landfill before decommissioning, so that the contents of the landfill will remain permanently frozen and isolated. Open burning of un-treated wood and cardboard wastes may be conducted to reduce volume requirements.

At the Mary River site the area of land required for landfill construction will be minimized because of planned waste minimization and recycling practices, and volume reduction from the incineration of food wastes. The landfill will only be operated by trained personnel who will carry out regular inspection and monitoring of the facility.

Hazardous and Recyclable Wastes

Hazardous and recyclable wastes will be temporarily stored in special containers and/or at designated locations on-site and will be respectively shipped to registered hazardous waste disposal facilities or to recycling depots. Manifests will be prepared for all materials shipped off-site and the receivers will be required to maintain chain of custody records.

4.1.3.7 Bulk Fuel Storage

All bulk fuels (e.g. Arctic grade diesel, gasoline, turbine jet fuel) will be shipped to the port at Steensby Inlet by ore carrier throughout the year, and in tankers during open water season, and stored in a tank farm at the port. Other bulk liquids (e.g. transmission fluids, lubricating oils, antifreeze and solvents etc.) will be transported in drums or large totes.

Fuel stored in the tank farm at Steensby Inlet will be transported to the mine on a weekly basis over the railway using fuel cars, and transferred into the mine site tank farm. The mine site will have a total diesel fuel storage capacity of about 16 million litres between two tank farms: one near the power plant and one near the mining operation. The tank farms will be equipped with a dike wall

containment system lined with arctic grade synthetic liner. Day-to-day refuelling of vehicles will be carried out at a fuel filling depot. Aircraft and the equipment in the pit will be refuelled using a fuel truck. A number of day tanks will be required at mine infrastructure locations and buildings.

4.1.3.8 Airstrip

Without road access, the mine can only be accessed year-round by air, so a runway capable of landing jet aircraft (e.g. Boeing 737) or turboprop aircraft (e.g. Dash 8) will be required. Based on the design requirements for the proposed aircraft, the runway will have a minimum length of 1,829 m. Baffinland will utilize the existing airstrip at Mary River for to support future Project operations. For safety reasons, the runway has already been located away from permanent facilities on relatively flat topography. In addition to the length, other improvements to the airstrip will include aircraft warning, obstruction, runway and approach lighting conforming to the requirements of the *Aeronautics Act*. Parking, loading, unloading and services will be conducted within the apron area.

A dedicated bulk fuel storage facility will store and dispense Jet A fuel to aircraft and helicopters. De-icing facilities, provided at the airstrip, will consist of a portable discharge pump for the application of de-icing fluid from 200 L drums. De-icing will be carried out to the side of the runway, with propylene glycol, a biodegradable fluid which requires no treatment. Alternately, aircraft may be refuelled directly from a tank truck.

4.1.3.9 Site Roads

Two categories of roads will be constructed to serve the mining operation. A 13 km long main haul road, suitable for mine haul trucks will connect the open pit, primary crusher, and waste rock stockpile areas. Access and service roads will be constructed to handle light-duty site and commercial traffic. Other light-duty roads include an approximate 6.5 km long road from the mine haul road in the north to the plant and the airstrip, and an approximate 3.5 km long road from the haul road to the explosive magazines, raw water pumphouse, water treatment plant and conveyors.

Roads will be constructed using aggregate obtained from locally quarried and crushed rock.

4.1.3.10 Communications

An integrated, multifunctional, communications and networking infrastructure will be installed as appropriate to provide efficient communications among the Project cooperating locations and other Baffinland facilities in Iqaluit, Ottawa and Toronto. In addition, all mobile equipment and locomotives will be radio-equipped.

The various sub-systems will include the following:

- Satellite land stations
- Telephone exchange switching systems (complete with voice message and plant internal PA capabilities)

- Trunked, VHF radio systems including base stations and vehicle and handheld portable radio equipment
- Integrated multi-use fiber-optic network with Ethernet TCP/IP network infrastructure
- Optional cellular phone system

4.1.3.11 Railway Terminal

The mine site will receive the majority of its supplies by rail. The railway terminal at the mine site will feature a crushed or loadout station for loading ore into cars. The terminal will also have a fuel unloading station for unloading fuel (jet A fuel, diesel, gasoline) into the tank farm, and for unloading of general freight and ammonium nitrate.

4.2 MILNE INLET

4.2.1 Milne Inlet Beach Landing

The Milne Inlet area will have a limited role during the operation phase of the Project, to receive oversized equipment by periodic sealift on an as-required basis. Sealifts will be unloaded using barges and the cargo brought to shore for storage in the designated laydown area established for previous exploration and bulk sampling activities.

The airstrip at Milne will remain operational.

4.2.2 Milne Inlet Tote Road

The existing Milne Inlet Tote Road connects Milne Inlet to the Mary River site. During the operation phase, the road will be used in winter-only and on an as-required basis, in years when oversized equipment is required that cannot be delivered to Mary River via the railway from Steensby Inlet. This will necessitate additional upgrades to the road during construction, to accommodate the very large and wide truck loads. Operation as a winter road requires snow clearing but snowfills or other temporary crossings are not expected to be required.

4.3 RAILWAY

4.3.1 Overview and Design Considerations

Baffinland plans to build a 143 km long railway to transport iron ore from the mine site to the port located at Steensby Inlet. The basic design is for a heavy haul mineral railway, although the line will also carry some mixed general freight traffic to supply the mining operation. A passenger train (for employees) will also operate three times a week.

The proposed railway system will consist of:

- Rail line and embankment -including tunnels, bridges and sidings
- Crossings - across watercourses and drainages
- Yards and terminals - including rail loop, coupling and turn-around

- Supporting facilities - including maintenance and emergency facilities
- Train - including locomotives (engines) and cars
- Cargo
- Signalling and telecommunications

The proposed railway route is shown in Figure 4.3.

To limit impacts to the existing environment, due consideration has been given to, where possible, avoiding encroachment of the railway track near lakes, rivers and other sensitive natural features. However, the demands of railway engineering place particular restrictions upon the selection of the route. For example:

- Railroad tracks cannot form tight bends (unlike roads) due to issues relating to rail wear and train speed
- If planners propose a winding 'S' shaped route (e.g. to deviate around natural features) then there must be at least 200 m of straight track between the two curves
- Changes in grade have to be carefully planned in order to avoid undesirable compression and telescoping of carriages
- Curved sections of track physically slows the train down resulting in increased power demands upon locomotives. Similarly, increases in grade require increased power output from the locomotives. The net result is that the maximum achievable grade must be decreased if the track is also curved.

A significant factor influencing the design of the railway, particularly route alignment, is permafrost and ground conditions. Most, if not all of the ground on Baffin Island has continuous permafrost, which is defined as ground remaining at or below 0°C continuously for at least 2 years. On Baffin Island, this permanently frozen layer of rock and/or soil is about 400 m deep. Above the true permafrost is the so-called active layer of ice, soil and rock, which is subject to seasonal freezing and thawing. In this area of Baffin Island, the active layer is typically from 1 to 3 m thick. There are varying ground conditions along the rail alignment, and site investigations are ongoing to define areas with thaw-susceptible soils. Special consideration, especially for the construction of bridge foundations, is being given to the potential effects of climate change, which could increase the depth of the active layer.

4.3.2 Proposed Route and Alignment

The proposed alignment of the route (subject to ongoing optimization) for the railway from the Mary River mine to Steensby Inlet; from Mary River the railway will proceed eastward from the mine across a long series of sand and gravel terraces that lie at the southern foot of the mountain range which the Mary River deposits are a part. Terraces are often deeply cut by drainage channels from the mountains. The route then bears slightly towards the south and crosses the Ravn River approximately 4 km west of the confluence of the Ravn and Turner Rivers. Next the route continues south for approximately 30 km across a smooth plateau that slopes gradually upwards towards the south and east.

At the southern end of the plateau, the route enters the Cockburn Lake valley, follows the west bank of a Cockburn River tributary, and then hugs the lake itself until the route crosses the lake at the natural constriction in the valley. Two short tunnels, totalling 1,050 m in length, will be required as the railway descends the Cockburn Lake Valley. The route then follows the east bank of the lake for approximately 14 km, through an area requiring tunnelling and benching in bedrock.

The route continues along the east side of the lake for another 13 km across well established sand and gravel terraces and benches. At the southern end of the lake, the route works its way towards the southeast, avoiding numerous rocky hills and waterlogged ground around small lakes, until it reaches the port site at Steensby Inlet.

A number of routing alternatives were considered early in the feasibility study process, including options to cross the Ravn River downstream of Angajurjualuk Lake; running along the base of the steep cliffs along Tariujaq Arm; as well as hybrid combinations of these two routes with portions of the proposed route. The proposed route was determined to be preferred based on technical, cost and environmental factors.

4.3.3 Railway Construction

The railway roadbed will consist of subgrade (embankments or cuts) and sub-ballast, which is a layer of graded crushed rock that will act as a filter layer between the embankment material and the ballast. The track structure, consisting of ballast, ties and rail, will be laid on top of the sub-ballast. During railway construction, significant quantities of sub-ballast and ballast will be required. These will be sourced from borrow areas located in proximity to the railway route (where possible).

A cross-section of a typical rail embankment is shown on Figure 4.4. Depending upon ground conditions, the rail embankment may be 1.5 m in height where the rail is constructed over rock or other thaw-stable soils, or up to 4 m in height in locations of thaw-susceptible soils. Ground conditions have a very large bearing on rail embankment construction, and mitigation of poor ground conditions ranges from avoidance, where possible, to excavation of thaw-susceptible and ice-rich soils, to construction of high embankments to insulate the rail bed from disturbing the thermal regime of the underlying soils. The height of the embankment has a large bearing on its width; a 1.5 m high embankment may measure as little as about 12 m toe of embankment to toe of embankment, whereas a 4 m embankment will measure about 50 m across.

Drainage facilities include bridges and culverts, ditches, dikes and/or berms and other protection works will be required along the entire railway route to protect against ballast washout due to surface drainage flow.

4.3.4 Watercourse and Drainage Crossings

A number of crossing structures are required along the route, including large bridges, smaller single-span bridges and culverts. Preliminary assignments of crossing structures for each drainage crossing are provided in Tables E6.1 and E6.2 in Appendix E6. Five preliminary bridge locations have been identified, with a total length of 1,400 m. Conceptual drawings of bridges for the

Mary River, Cockburn Lake, Ravn River and BR-137 (un-named) watercourses are included in Appendix E6. Several shorter bridges will be required over smaller watercourses and the majority of drainages to be crossed using culverts. Typical open deck single span bridges and culvert designs in thaw-stable and thaw-sensitive ground are also included in Appendix E6.

4.3.5 Trains and Rail Cars

Three trains will operate to transport ore. Each train will consist of several diesel-electric locomotives towing about 110 rail cars. The total fleet required has been estimated at 11 locomotives, (6 used for ore transport, 2 used for general freight and passenger (employee) train service, along with 3 spares), and 367 cars (with 34 spares). A photograph of the type of locomotive and ore cars to be used is shown included as Figure 4.4. Each train will travel 1,806 km over a 66 hour period, after which it will be subjected to a detailed safety inspection.

To reduce freight handling and to facilitate door-to-door delivery, general freight will be hauled in containers. Bulk materials used for mining operations will be hauled in tank cars or containers. Two types of cars will be required for the haulage of bulk and general freight: flat cars and tank cars. Dedicated tank cars will be needed for Jet A fuel and diesel fuel. Flat cars will be used to transport containers and large sized equipment and machinery.

There will be a regular passenger train service to move employees between the port and the mine site. This will require a passenger car, baggage car, and a generator car.

4.3.2 Railway Operations

The railway will be used predominantly for the movement of ore from Mary River to Steensby Port, but will also be used to shuttle workers arriving and departing from the Mary River airstrip during operations to and from the Steensby Port work site, and for the re-supply of materials and fuel arriving at the port to Mary River.

Maximum design speed will be 75 km/h, but the initial maximum operating speed is expected to be 60 km/h. Temporary slow orders may be required over parts of the route during the warmest period between mid-June and late August.

Combined signal and telecommunications systems will be used to safely manage the operation of mineral trains with more than 100 cars per train travelling at speeds up to 75 km/h. In addition to ore trains, the system will also manage freight trains and passenger trains.

4.3.2.1 Ore

Each year, an estimated 18Mt of ore will be transported by railway from the mine site to the port at Steensby Inlet. Total ore train length will be between 1,046 and 1,201 m depending on maximum axle load. Ore will be loaded into the uncovered cars at an estimated rate of 6,000 tonnes/hour, while the cars are in motion (through the top of the gondola car). The cars will be unloaded by rotary dumping.

4.3.2.2 Fuel

Fuel and freight trains each will run once a week. Whenever possible, these will be dispatched according to the operating patterns in such a way as to minimize mainline meets.

4.3.2.3 Passengers

A passenger train for employees travelling between Steensby Inlet and the airstrip at the mine site will operate an estimated three times a week.

4.3.2.4 General Freight

The railway line will carry some general freight traffic to supply the mining operation, such as ammonium nitrate (used to make explosives) and equipment.

4.3.3 Railway Maintenance

Maintenance of both the railway equipment and the railway track and embankment will be required throughout the life of the Project.

Locomotive maintenance will be scheduled, based on inspections which will occur on a regular basis. The typical inspection cycles will be daily, 90 day, annual and biannual. Car maintenance will be based on the results of the trip inspection carried out every 1,800 km. Brake tests and the replacement of brake hoses will also be scheduled activities.

Track maintenance is planned on the basis of a series of specific types of inspection carried out at regularly-defined intervals. These will include general visual inspections, detailed safety inspections, ultrasonic scanning for rail flaws and measurements of the track geometry.

The recommended approach to track maintenance is spot renewal which provides for the spot replacement of defective components on a daily basis. Also programmed maintenance over specific track segments will include such activities as rail grinding and the replacement of worn or defective components throughout a designated track section.

All railway equipment and rolling stock inspection and maintenance activities will be performed at Steensby Inlet in the fully equipped maintenance centre.

4.4 STEENSBY PORT SITE

4.4.1 Introduction

During operations the Steensby Inlet port infrastructure will consist of:

- Service and tug docks
- Ore management facility
  - Dual rotary rail car dumper
  - Ore stockpiles and rail-mounted stacker/reclaimer system
  - Secondary screening plant
  - Ore loading dock

- Port site facilities:
  - Power generating station
  - Communications system
  - Service/administration/accommodation buildings
  - Maintenance shop/main office
  - Potable water treatment system
  - Wastewater treatment system
  - Tank farm
  - Incinerator
  - Airstrip
  - Navigational aids as required by the Canadian Coast Guard
  - Site roads
  - Railway maintenance facility and offices
  - Rail yard

A plan showing the Steensby Inlet port layout is shown in Figure 4.5.

4.4.2 Siting Considerations

The siting objectives for the Steensby Inlet port infrastructure will be similar to the mine site i.e. they will include:

- Limit environmental impact
- Provide a safe working facility
- Minimize earthworks
- Provide efficient heat recovery from power plants
- Provide attractive and effective living accommodation for employees
- Minimize the distance between the accommodation area and work areas to maximum practical extent

The ground conditions at the Steensby Inlet port site consist of exposed rock or bedrock relatively close to the surface. As a result, foundations for the majority of structures will be founded directly on rock with the following exceptions:

- Accommodation/administration/maintenance/laboratory complex and corridors/utilidors
- Rail unloading building (excluding the car dumper bays)
- Some sections of the stacker/reclaimer

The above structures will be supported on relatively short rock socketed steel piles.

Consideration will be given to the choice of all ancillary facilities including the incinerator, water treatment and wastewater treatment facilities.

4.4.3 Docks

There will be three docks located at the port in Steensby Inlet:

- A service dock used for unloading of general freight located at the northwestern section
- An ore loading dock located on the southwestern tip of Steensby Island
- A tug fuelling dock located at the northwestern section

Bathymetry using side-scan sonar was conducted along the shoreline of Steensby Inlet at the planned dock locations. Preliminary dock designs are included in Appendix E, and are described below. Ongoing engineering and review of alternatives may result in modifications to these feasibility level designs.

Service and Tug Refuelling Docks

The service dock and tug refuelling docks will be located in a protected bay and will be constructed using sheet pile technology. Jet A, gasoline, some diesel fuel, and other freight will be delivered to the service dock where a warehouse yard will serve as a storage area. The service dock will handle tankers and freight carriers containing mine and railway equipment. The service dock will be utilized only in the summer open-water season which lasts around 2 months.

Ore Loading Dock

The ore loading dock will receive an average of 12 ore carriers per month on a year-round basis and up to 17 vessels per month in summer open-water season when non-icebreaking ships will bring additional materials and supplies. Steel shell technology has been applied to the ore dock design. A dock for cape-size ore loading carriers with a draft of 17.8 m is a major dock and represents a significant engineering and operational challenge for use in the harsh Arctic conditions. The planned annual 18 Mt ore throughput also means frequent winter traffic.

Due to the volume of diesel that will be consumed by the mine and other operations, year around fuel deliveries will be required. As such, incoming ore carriers will bring fuel supplies where diesel fuel will be delivered to the ore loading dock and pumped about 3.3 km to the storage tanks.

The winter ice cover is expected to remain stable in the area, even if it is repeatedly broken because of rapid refreezing of ship tracks. The dock may be subjected to substantial ice forces and also ship impact forces. In this case, partially-frozen backfill will provide a strong stratum against these forces.

4.4.3.1 Ice Management

When ice is repeatedly broken, accelerated brash ice growth occurs, as there is a lot of free water exposed directly to freezing temperatures. The more frequently ice is broken, the more brash ice is formed. This has repercussions when ore carriers are stationary in dock.

To reduce the risk of ships becoming frozen in during the wintertime, ballast water is typically heated by waste heat from the ships engines. This warm ballast water is released from the ship during ore loading to melt brash ice at berth. Baffinland is currently evaluating whether warm water alone is sufficient for ice management at the dock and will continue to look for technically viable economic solutions that are in-line with best management practice.

4.4.3.2 Ore Management

Ore from the mine site will be transported by train to the port at Steensby Inlet for stockpiling prior to shipping. A flowsheet diagram showing the steps involved in processing the ore from the mine site through to its loading onto the ore carriers at the port is shown in Figure 4.2. Ore handling at the port will take place on the island which will feature:

- Secondary screening plant - once unloaded, ore will be re-screened to separate out any fines generated during transportation
- Stacker/reclaimer
- Two lump ore stockpiles (estimated at 2 Mt and 0.7 Mt capacity, respectively)
- Fines ore stockpile (estimated at 1 Mt capacity)
- Ore loading dock

Ore will be loaded onto ships at a rate of about 12,000 t per hour, suggesting that a 135,000 dry weight tonne (DWT) ship will take about a half a day to fill.

4.4.4 Port Site Support Facilities

4.4.4.1 Port Site Buildings

Accommodation Complex

The accommodation building will consist of a combination of prefabricated modular units supported on pile foundations. The facility will be designed to accommodate approximately 175 people in two, two storey dormitory wings. A central core area will comprise kitchen/dining facilities, recreational facilities and general service space.

Maintenance Complex

The maintenance building, which will house maintenance, warehousing and administration offices, will be constructed of structural steel with a prefinished metal roof and wall cladding, all supported on a concrete foundation. Access to the building will be by man doors, overhead door,

corridor/utilidor and high multiplex doors (in the repair shops). A separate maintenance facility will be provided at the port to service locomotives and railway rolling stock (Section 4.4.4.11).

4.4.4.2 Power Supply

A centralized 22MW power plant designed to service the entire port will be located close to the accommodation complex. The running load is estimated at 11 MW and annual energy consumption is estimated at 120 000 MWh. The port power plant features will be similar to the mine power plant as described in Section 4.1.3.2. The power plant building will be connected to the accommodation complex through an utilidor.

As discussed in Section 4.1.3.2, Baffinland conducted a pre-feasibility study on alternative energy options to supply power to either or both of the mine site and Steensby port site. A potential hydro-electric station and distribution power line has been identified at Separation Lake, located approximately 58 km east of the Steensby Inlet port site. The hydro-electric site does not form part of this Development Proposal. While hydro-electric power does not form part of the Project, Baffinland continues to evaluate this energy option for potential longer-term implementation.

If it is determined that sufficient hydro power is available, a power line could be extended along the rail line to service the Mary River site in addition to the Steensby Port site. Baffinland intends to further evaluate the feasibility of hydro-electric power generation over the next several years. Separate approvals will be sought if the hydro-electric site provides viable.

Corridors/Utilidors

Elevated corridors/utilidors will connect all buildings in the port area. Besides providing access corridors for personnel, they will also contain heating services, piping and electrical trays/conduits. Utilidors will be constructed with prefabricated modular units on a structural steel framing system and pipe piles.

4.4.4.3 Water Supply

The port potable water supply will be obtained from a reverse osmosis desalination plant located on the west shore of the mainland. The exact location and construction of the intake will be confirmed through 2008. Desalinated water will be pumped through an insulated steel pipeline to the port facilities. The treated water will be stored in two freshwater tanks, where it will be used for potable water.

4.4.4.4 Wastewater Treatment

The port wastewater treatment system will be similar to the mine system as described in Section 4.1.3.4.

4.4.4.5 Waste Management

Waste management system at the Steensby port will consist of an incinerator similar that at the mine site (Section 4.1.3.6), as well as a designated temporary storage area for non-combustible, benign waste that will be transferred by rail to the mine site for landfill disposal.

4.4.4.6 Bulk Fuel Storage

The diesel tank farm at Steensby Inlet will have a total storage capacity of approximately 45 ML. The size of the tank farm accounts for storage needed for refuelling of the tank farm at the mine site, as well as the nature of ship re-supply, with regular shipments coming on the ore carriers year-round and large re-supply during summer by tankers. The tank farm will be located inside a dike wall containment system properly lined with arctic grade synthetic liner.

4.4.4.7 Ammonium Nitrate Storage

Ammonium nitrate (used for making explosives) will be securely stored in a storage facility located close to the freight dock.

4.4.4.8 Airstrip

During operations, all incoming/outgoing personnel will be transported via railway. Therefore, only a helicopter pad located near the accommodation complex will be provided for emergency use. The airstrip used for construction will be maintained for emergency purposes only during operations.

4.4.4.9 Site Roads

The site road system will be constructed using aggregate obtained from locally quarried and crushed rock.

4.4.4.10 Communications

Communications infrastructure will be as per the description in Section 4.1.3.10.

4.4.4.11 Railway Yard and Terminal

The Steensby yard will include railway maintenance and operations building, including maintenance and administration operations, as well as car control and train dispatching. The yard will include about 15 km of yard trackage. The maintenance centre will service locomotives and railway rolling stock. It is designed to be expanded in stages over the life of the project as the railway maintenance requirements increase over time. The track maintenance crews will be housed at Steensby Inlet.

The railway terminal at the port will be used for offloading ore and for loading of supplies, equipment and bulk fuels onto trains for transportation to the mine site. To facilitate these activities, the railway terminal will feature:

- A twin rotary rail car dumper for offloading ore from the rail cars onto the ore stockpiles
- Fuel loading facilities for transferring fuel from the bulk fuel storage facility to the rail tank cars
- A small intermodal yard for container handling

4.5 SHIPPING

4.5.1 Overview

The viability of the Project relies on the constant supply of iron ore to customers, and therefore shipping of iron ore to market must occur on a 12 month-per-year basis. To ship ore to market, Baffinland has engaged Fednav, a Canadian ship owner and operator, to manage the shipping operations for the Project. Fednav intends to form a consortium of ship owners to design, finance, build, and own the ships that will be used to carry the iron ore from the Project to markets in Europe. Fednav's consortium will own and operate the dedicated fleet of ships required by the Project. Baffinland will charter the ships from the shipping consortium.

The dedicated fleet of icebreaking cape-size ore carriers will transport most of the ore to market, supplemented by the use of ships chartered on the open market during the open water season. The ships will operate in accordance with two primary legal instruments regulating ship traffic in the Canadian arctic: the *Canada Shipping Act*, and the *Arctic Waters Pollution Prevention Act*, and their associated regulations.

During the operation phase, nearly all shipping (and all icebreaking) will be to the Steensby port. Dedicated voyages to re-supply materials and equipment will travel to Steensby port during the open water season using the type of ships currently used to support the Mary River Project and other northern sealift operations. Diesel fuel will arrive on the dedicated ore carriers, supplemented in the summer by fuel tankers as necessary. Other fuels will be delivered by normal sealift tankers to the Steensby port during the open water season. Shipping to Milne Inlet will occur infrequently throughout the operations phase and only during open water, when oversized equipment is delivered that cannot be transported via the railway from Steensby Port.

4.5.2 Shipping Routes

There will be three main shipping routes for the Project:

- Steensby Inlet to Rotterdam, for the movement or ore and most re-supply of fuel
- Steensby Inlet to a southern Canadian port, for re-supply of materials and some fuel and equipment by conventional sealift over the open water
- Milne Inlet to a southern Canadian port, which will occasionally receive oversized equipment for the Project via conventional sealift over the open water

The route for marine shipment of the ore from Steensby port to Europe is south out of Steensby Inlet through Foxe Basin along the east side of Koch and Rowley Islands to where it joins with the established shipping lanes in northern Foxe Basin accessing Hall Beach and Igloolik (Figure 4.6).

Prior to 2007, when Baffinland commissioned bathymetric surveys on two shipping lane options, only cursory hydrographic surveys had been completed in the area by the Canadian Hydrographic Service about 40 years ago. Baffinland retained Kivalliq Marine Ltd. to conduct bathymetric surveys in accordance with the standards of the Canadian Hydrographic Service, of two shipping routes through northern Foxe Basin from points of departure from the established shipping route to Igloolik and into Steensby Inlet. The more westerly route departs from the existing shipping lanes near to Igloolik and Hall Beach and runs west of Rowley and Koch Islands. The easterly route departs from the existing shipping lanes south of the Spicer Islands, and runs along the east side of Rowley and Koch Islands. Based on the results of 2007 surveys, both routes are viable for the Project, but the eastern route is operationally preferable. The communities of Igloolik and Hall Beach have indicated preference for the more easterly route during public meetings held by Baffinland in September 2007, on the basis that this route was more removed from primary land use areas by the communities. Baffinland has selected the easterly route in consideration of available information, and additional "fill-in" bathymetric survey of the easterly route is planned in 2008 or 2009, adequate for developing full navigational charts.

The shipping route to Milne Inlet is well established; extending from Baffin Bay and passing through Pond Inlet, Eclipse Sound and to the head of Milne Inlet.

In addition to the route selection through northern Foxe Basin, major transportation alternatives were considered for the Project including alternate shipping routes such as shipping from Milne Inlet (which would necessitate a railway built to Milne Inlet). The shipping route from Steensby Inlet was preferred based on a number of factors, including technical factors such as the difficulty of ice navigation (related to the polar class of vessel required for ice breaking). Milne Inlet is relatively narrow and represents operational uncertainty as to whether or not ships can break ice repeatedly within the brash ice that would form within the narrow inlet. There are also environmental sensitivities such as the potential for interactions with Inuit use of the landfast ice in the area, important summering habitat for narwhal within Milne Inlet, and proximity to a national park.

Other transportation alternatives raised by communities included constructing a railway to connect to and use the existing port at Nanisivik, and constructing a railway to either Baffin Bay or South Baffin Island and east along the Ravn River to the coast. These options were considered in a preliminary way but were determined not to be viable based on cost.

4.5.3 Ship Speeds and Transit Times

The service speed of the icebreakers and other vessels in open water at full draught is about 14.5 knots and the maximum speed is over 18.5 knots. In ice conditions and at full power, 1.2 m thick level ice can typically be broken at over 7 knots speed; 3 knots in 2 m thick ice.

The duration of a round trip from Steensby port to a destination port in Europe in open water is 20 days, and in the heaviest ice conditions during a severe winter, the sailing time may be over 45 days.

The resulting shipping schedule considered in the DFS includes 141 voyages to Steensby port each year, or 282 transits to and from Steensby Inlet. This equates to a ship moving through the shipping lane roughly every 1.3 days (32 hours). This shipping frequency will increase during the open water shipping season when sealifts will provide annual re-supply and supplemental market vessels to ship additional ore.

4.5.4 Ice Navigation

Enfotec Technical Services, the ice navigation consulting arm of Fednav, conducted an ice and marine shipping assessment in support of the Project. The study included a detailed analysis of the series of winter ice atlases of the region compiled by the Canadian Ice Service since 1990 as well as numerous satellite images, to delineate areas of old ice concentration, ridged and pressured ice, as well as shear zone locations. The ice study supported the selection of Steensby Inlet as a port location, defined the proposed shipping lanes, and determined the appropriate ice class of the proposed vessels.

Ice conditions along the shipping route (extracted from Enfotec, 2007) are as follows:

- The waterway in the access to the proposed port site in Steensby Inlet develops shore fast ice each winter. The southern anchor of the shore fast ice reaches Koch Island. The boundary between the shore fast ice and the mobile pack ice of the northern Foxe Basin represents a diverging ice edge over the winter with the result that an open water lead is usually always present off the fast ice edge. The additional benefit of this diverging condition is that no shear ridge occurs along the fast ice edge in winter. There is an average of 35 nautical miles of shore fast ice leading to the Steensby Port site.
- There are no known measurements of the thickness of the fast ice of Steensby Inlet. However, the closest ice thickness measurement station in the region at Hall Beach to the southwest of Steensby Inlet has recorded average ice thicknesses at the end of the winter's growth of 192 cm with extremes of over 250 cm. These thickness average 5% to 10% more than those recorded at Pond Inlet. The shore fast ice appears very level with few ridges or leads and no possibility that old ice can become entrained in the ice over as is the case in Eclipse Sound.
- The first signs of the spring break-up is the widening of the leads found in northern Foxe Basin and along the south coast of Baffin Island during the month of April and May as solar radiation increases in the region.
- Ice reduction is slow and gradual during the months of June and July as Hudson Strait clears of sea ice and the ice edge in the Foxe Basin retreats northward.
- The fast ice of Steensby Inlet fractures during the second and third week of July. The fracture begins with the fracture of the lower portion of the fast ice in late June and this is followed by the complete fracture of the Inlet by the fourth week of July.

- The pack ice of the Foxe Basin continues to reduce during the months of August and September as strips and patches of ice in the basin gradually melt. In rare cool summers some of this remnant pack ice will remain in the Foxe Basin to become second year ice by October 1.
- Sea ice can commonly occur in the access channels into the month of September before clearing. The incidence of first year ice surviving the summer's melt has reduced in recent years and now only occurs approximately in 10% of summers. The occurrence of remnant ice in the Foxe Basin does not preclude the use of market vessels during the late summer period for the Project although some measures such as using an owner familiar with navigation in sea ice and experienced Ice Navigators would provide mitigation.
- Freeze-up starts in late October with new/young ice expanding southward from northern Foxe Basin and extending eastward through Hudson Strait in December.

The estimated 282 transits by the icebreaking ore carrier fleet to Steensby port each year, corresponds to some 185 transits that will occur during the period of November through June, when air temperatures result in the formation of ice within the ship track. Evidence of the ship track in the mobile pack ice south of the Steensby Inlet fast ice edge will quickly disappear due to the movement of the ice by winds and tide. Evidence from the MV Arctic's(another ore transport ship providing winter transport through Hudson Strait) transit of Hudson Strait in winter indicates that the ship track is indiscernible in the pack ice within six hours of the ship passing. Within the fast ice of Steensby Inlet, the ship track will remain throughout the winter. Due to the extreme cold, the ship track will quickly begin to refreeze following the passage of the vessel. Due to the frequency of transit through the track, ice formation will be continuous resulting in the build-up of rubble in the track over time. Consequently, the width of the track will gradually widen from the initial width of 100 metres to three kilometres or more by late winter.

4.5.5 Shipping Fleet

A dedicated fleet of 10 ice class cape-size vessels with a capacity of about 135,000 dry weight tonne (DWT) capacity will operate on a 12 month a year basis to transport 90% to 95% of the annual ore production to market. These vessels will be supplemented by chartering additional ships from the open market in the ice-free summer months.

Icebreaker ore carrier designs have been evaluated, and continue to be evaluated. The currently envisioned 135,000 DWT icebreakers will be designed as Polar Class 4 vessels, which relating to Canadian classification is between a CAC 3 and CAC 4 design. These ships would be 300 m long, 46 m wide, and have a maximum draft of 17.8 m when fully loaded. While also a subject of ongoing evaluation, it is expected that at least one of the icebreaking ore carriers will be equipped with an additional fuel tank holding in the order of 3 ML of diesel fuel, in addition to the ship's own fuel tank. The ship(s) would deliver fuel to the Steensby port upon arrival to load ore, thereby providing a year-round supply of diesel fuel to the Project. Some fuel tanker deliveries of fuel during open water is also expected to fully supplement the annual fuel needs of the Project.

Figure 4.7 shows the proposed ships in relation to the MV Arctic, a 28,000 DWT capacity ship currently dedicated to shipping ore concentrate from the Raglan Mine located in Deception Bay of Nunavik. The MV Arctic, operated by Fednav, is a familiar ship in the north, as it shipped ore

concentrate for the Nanisivik and Polaris mines for many years. The capacity of the cape-sized ice breaking vessels is nearly five times the size of the MV Arctic. However, the overall length and width of the proposed ships are less than a factor of 2 greater than the MV Arctic. The large increase in ship capacity without the same incremental increase in ship dimensions is primarily a result of the depth and increased draft of the ship.

Vessel docking will be assisted in the ice-free period by two harbour tugs and linesmen on the docks. No tugs or ice breakers are required during operations in ice, as the ice class cape vessels will be sufficiently powerful to break the ice without assistance. Consideration is being given to rubble ice management techniques at the dock, including potentially using an ice management vessel.

4.5.5.1 Design Basis for Icebreaking Ore Carriers

The ability of a ship to transit ice-covered waters is determined by the vessel's ice class, a notation applied to the vessel's class certificate based on the amount of ice strengthening. The International Association of Classification Societies (IACS), as well as governments including Canada and Russia, has set rules to classify ships based on the amount of ice strengthening contained in the vessel. The IACS Unified Requirements for polar vessels will now be the standard by which all IACS members will classify Polar Vessels built after July 1, 2007, including the vessels built for the Mary River Project. The Polar Class 4 vessels identified for the Project are classed by IACS for "year-round operation in thick first-year ice with old ice inclusions."

Transport Canada regulates an Ice Regime Shipping Control System (IRSCS) as part of Arctic Shipping Pollution Prevention Regulations - ASPPR (Transport Canada, 1989). The IRSCS defines "Ice Regimes", as regions of generally consistent ice conditions based on a simple arithmetic calculation that produces an "Ice Numeral" that combines the ice regime with the vessel's ability to navigate in the region. Every ice type (including open water) has a numerical value that is dependent on the ice category of the vessel. This number is called the Ice Multiplier. The value of the Ice Multiplier reflects the level of risk or operational constraint that the particular ice type poses to each category of vessel. The ASPPR Zones that are transited to reach Steensby Inlet are Zones 15 and 8, with Zone 8 that covers Foxe Basin as the limiting zone with the higher ice regime designation of the two zones.

The IRSCS is based on previous vessel ice classification nomenclature, for which there is no established equivalencies to the new polar class standard. In the selection of the Polar Class 4 vessels as appropriate for the Project, Enfotec used the parameters of the ASPPR and the Arctic Ice Regimes Shipping System (AIRSS) to determine estimated access dates by ice class.

Because the vessels for Mary River will be of modern construction and specifically designed for project operational conditions, features can be designed into the ships to mitigate air, noise and water interactions.

The shipping season for vessels of Baltic ice class design spans from August 10 to the third week of October. This represents the "open water" season available for re-supply and the use of charter vessels to supplement ore delivery.

4.5.5.2 Ballast Water Management

Ballast is water taken on in chambers of vessels mainly to stabilize sea-going vessels, by adding weight to the vessels and maintaining a certain draft (the depth a vessel sits in the water). Empty vessels take on much more ballast than a fully laden ship. For icebreakers, ballasting is also used to keep the ice draft of the vessels constant, and to stabilize the ship, thereby optimizing stresses in different loading conditions.

Ships will exchange ballast water in accordance with The Canadian Ballast Water Control and Management Regulations (Transport Canada, May 2006). The regulations prescribe ships transiting to Canadian ports to exchange ballast water at sea in deep seas away from coastal zones, to limit the potential for foreign harmful aquatic organisms or pathogens to be released in Canadian waters where they may colonize. Ballast water will be exchanged in the mid-north Atlantic Ocean, which is part of the same ocean regime as Steensby Inlet. Upon arrive, the ships will discharge ballast water (approximately 100,000 m^3 based on the 135,000 DWT ships proposed) at the Steensby port as the ships are loaded with iron ore.

4.5.5.3 Waste Management

It is expected that the main engines of the vessels will be provided with exhaust gas catalysators, which will reduce air emissions. The vessels will be equipped with a sewage treatment plant and an incinerator for solid and liquid wastes. All tanks containing oil or oily waste will be placed in a location in the ship that will keep them separated from clean areas. A diesel fired incinerator for incinerating oil waste and sludge from the sewage plant will be installed in the incinerator room on board.

4.6 OFF-SITE FACILITIES SUPPORTING THE PROJECT

In addition to facilities constructed on-site, Baffinland may support mine site operations with airport facilities located in Iqaluit and Ottawa, suitable for management of personnel, airfreight and mine administration.

4.7 CLOSURE AND RECLAMATION PHASE

4.7.1 Overview

Conceptual mine closure planning has been completed for the Mary River Project for the Definitive Feasibility Study, based on the Project life of 21 years, with the intent of providing that former project areas are physically and chemically stable, to provide both public safety and environmental protection in the long-term. Materials and equipment will either be removed from site or disposed of in the open pit, and all hazardous materials and wastes will be removed from site to licensed disposal facilities. The open pit and waste rock stockpiles will be inspected for physical stability. Roads, airstrips and development areas will be recontoured as required to provide long-term

stability and reduce the potential for erosion. Steel rails will be removed from the rail line, and tunnels will be blocked. The closure phase is expected to be 3-years, followed by a minimum of 5-years of post-closure environmental monitoring.

4.7.2 Closure Objectives

The general closure and reclamation goals for the Mary River Project are as follows:

- Provide for the long-term physical and chemical stability of the Project areas so as to protect the public's health and safety
- Enhance natural recovery of disturbed areas to a state that is compatible with surrounding land uses and to allow for future use by people and wildlife
- Implement reclamation designs that limit the need for long-term maintenance and monitoring

These goals are based on following guidelines and policy:

- Guidelines for Abandonment and Restoration Planning for Mines in the Northwest Territories, by Northwest Territories Water Board, September 1990
- Mine Reclamation in Northwest Territories and Yukon, Prepared by Steffen, Robertson and Kirsten (B.C.) Inc. for the Northern Affairs Program of the Department of Indian Affairs and Northern Development, April 1992
- Mine Site Reclamation Policy for Nunavut, Department of Indian and Northern Affairs Canada (INAC), 2002

Final closure and reclamation will include removing all equipment and materials and placement into either the on-site landfill at Mary River or into the bottom of the closed open pit (for inert materials), and restoring ground surfaces to pre-construction conditions where practical. Other equipment and materials will be transported off-site to Milne Inlet or Steensby Inlet from where they will be shipped elsewhere for either salvaging or proper disposal.

The following summarizes the closure and reclamation considerations for major project components:

4.7.3 Open Pit

The pit walls of the open pit will be inspected for physical stability at closure. Neither waste rock nor exposed ore left in the pit is expected to generate acid or leach metals after closure and reclamation. However, monitoring and evaluation of potential acid generating characteristics will be ongoing during the operations phase such that a firm understanding of rock type characteristics will be developed by the time of closure. Then, at closure the pit and walls will be visually inspected as part of the post-closure monitoring program to identify any indications of acid generation or metal leaching rock types. Any rock types exhibiting adverse geochemical characteristics that are exposed in the pit walls would be addressed appropriately.

A perimeter barrier of boulders will be constructed around the pit where access is readily available (i.e., where large waste rock stockpiles do not already provide a barrier), to prevent accidental entry by humans and wildlife. Access roads to the pit will be blocked using large rocks or beams.

4.7.4 Waste Rock Piles

The waste rock piles will be inspected for signs of physical and chemical stability. Operational plans to selectively place potentially acid generating materials as appropriate will limit the potential for adverse geochemical reactions and cover materials on the facility would be of benign rock types. The waste rock piles will be revisited as part of the post-closure monitoring program, to assess if physical or chemical stability issues require additional action.

4.7.5 Mine and Port Infrastructure

Infrastructure and equipment will be either transported to Milne or Steensby Inlet for shipment back to the mainland via sealift for disposal or salvage, or will be removed to the on-site landfill or disposed of in the bottom of the closed open pit after operations.

Concrete pads will be broken up and covered in place. Piles will be cut off just below grade and covered with local soil.

The dock structures in the water at Steensby Inlet will be left in place.

The causeway to the island at Steensby Inlet will be removed and the crossing re-opened.

The mine and port site infrastructure areas, including the ore stockpile pads, will be recontoured at closure.

Fuel Storage

All fuel will be used prior to mine closure. Tanks, drums, bladders and other fuel storage containers as well as distribution pipework will be removed after being thoroughly drained. Secondary containment liners and bedding will be tested for petroleum hydrocarbons before being removed. Liners will be sent off-site for disposal at a licensed facility. Soil beneath the lined areas will also be tested for petroleum hydrocarbons. A contaminated soil management plan will be subsequently developed.

The reclaimed fuel storage areas will be recontoured at closure.

Chemicals

Chemicals such as cleaning supplies, lubricants, antifreeze, oils, and greases will be transported off-site for either re-use or disposal. Used batteries and any other hazardous waste will be taken off-site to a licensed disposal facility for recycling or proper disposal.

Waste and Water Management

Combustible non-hazardous wastes will be incinerated on-site. Non-combustible bulky waste that has no salvage value will be landfilled on-site or disposed of at the bottom of the closed open pit.

The water supply system (tanks and lines) will be drained, dismantled, and will be either disposed of at site in the landfill or the open pit or will be transported for salvage or disposal off-site.

Sewage treatment plants will be decommissioned in accordance with manufacturer's procedures, and any remaining sewage or sludge will be incinerated. The treatment plants will be transported off-site or disposed of at site in the landfill or open pit. Lagoons and sediment control ponds, if used, will be backfilled and re-graded and levelled.

Materials disposed of in the bottom of the closed open pit will be covered with a 3 m thick cover of inert waste rock.

The landfill site will be covered with a 1.5 m thick layer of inert overburden. The landfill will have been progressively closed during operations prior to final mine closure as part of normal facility operations.

Explosives

Unused explosives will be securely contained in magazines and removed from site. The explosives magazines will be sent offsite via sealift for proper disposal or re-use.

Contaminated Soils

Contaminated soils will be managed in-situ or ex-situ on-site, as appropriate, or removed off-site for disposal at a licensed treatment or disposal facility.

4.7.6 Aggregate Sources

Borrow areas will be progressively reclaimed as part of operations, including maintaining stable side slopes and restoration of natural drainage. Final regrading at closure will be completed as required to re-establish natural drainages and limit the potential for excessive erosion. Borrow areas will be revisited as part of the post-closure monitoring program, to document that no substantial thaw settlement has occurred that will necessitate further remedial action.

4.7.7 Roads and Airstrips

Bridges and drainage crossings will be removed and the crossings returned to pre-construction conditions as much as possible.

The road embankments will be left in place. Based on site experience, it appears that ripping and revegetation attempts will cause more disturbance than leaving roads unreclaimed. As such, no ripping or revegetation is planned along the roads.

Airstrips will remain to allow for future access to the site for site inspections and other monitoring activities. Airstrip lighting will be removed. All buildings and infrastructure will be removed.

4.7.8 Railway

The steel rails will be removed from the rail line and transported to Steensby Inlet and then shipped offsite for salvage. Bridge and drainage crossings along the rail line will be removed and the crossings re-established. The rail ties and embankment will be left in place. Tunnels will be plugged and backfilled with rock or other suitable material. No ripping or revegetation will be carried out along the rail line.

4.7.9 Timing and Schedule for Closure and Reclamation

The timing of closure and reclamation is largely governed by weather. Activities such as removal of lined containment facilities and the testing and excavation of affected soils are better completed during summer months when the ground surface is not frozen. Timing of shipping off-site for proper disposal will be governed by sealift schedule, which is possible only during the open water period of August to October.

It is estimated that a minimum of 3 years will be required to complete closure and reclamation activities for the Mary River Project. These activities are expected to undertaken primarily during the months between March and October under favourable weather conditions.

4.7.10 Closure and Post-closure Monitoring

Monitoring and follow-up inspections will be conducted of the Mary River Project area in order to assess the physical and chemical stability of various components after closure and reclamation of the facilities. Annual inspections of the affected sites will be carried out for five years following the final closure to demonstrate that conditions have not changed and remain both physically and chemically stable.

The physical stability of the open pit, waste rock piles, rail rock cuts, and other Project components will be monitored through visual inspection. The chemical stability of the site will be monitored through visual inspections periodically. Where it is deemed necessary water samples will be collected and analyzed during the closure and reclamation period and for a five year period after reclamation to document that its quality is not adversely affected by the closed Project components. Monitoring of terrestrial and marine mammals will also be carried out over a 5-year time period following reclamation.

At the conclusion of the post-closure monitoring period all development areas related to the Project will be subjected to a closure inspection. At the end of each year and at the end of the 5-year monitoring period an abandonment and reclamation report with photographs will be prepared, documenting the reclamation work completed and the site conditions.

SECTION 5.0 - WORKFORCE AND HUMAN RESOURCES

5.1 WORKFORCE REQUIREMENTS

Workforce requirements have been estimated in the DFS for both the construction and operation phases of the Project. These estimates will enviably change as engineering and planning for construction continues to be refined overtime but are presented to provide a guide as to the general size of the workforce during the construction and operation phases. Manpower requirements during the closure and reclamation phase are typically a subset of the operational requirements, and as such are not discussed separately.

5.1.1 Construction Phase Workforce

Construction is scheduled to begin mid-way through 2010 and carry through into 2014 according to the current project schedule (Section 1.3.4). The estimated workforce fluctuates throughout the 4-year construction phase, as well as seasonally each year. The estimated construction workforce, shown below, ranges through the year and between each year, when the mine is commissioned and operation phase staffing ramps up.

Estimated Site Workforce During Construction

Year	Site Construction Workforce	Owner's Team	Operation Phase Workforce
2010	515 - 800	20 - 30	0
2011	680 - 1,760	20 - 30	0
2012	750 - 1,580	20 - 30	10 - 20
2013	330 - 880	20 - 30	30 - 200
2014	220	20 - 30	200 - 450

Existing ongoing exploration staffing is not included in the above table.

Estimated Project Payroll (On-site and Off-site) During Construction

Year	Site Construction Workforce	Owner's Team	Operation Phase Workforce	Total Labour Force on Payroll
2010	770 - 1,200	30 - 40	0	800 - 1,240
2011	1,025 - 2,640	30 - 40	0	1,055 - 2,680
2012	1,120 - 2,370	30 - 40	20 - 30	1,170 - 2,440
2013	500 - 1,320	30 - 40	50 - 350	580 - 1,710
2014	330	10 - 40	350 - 765	690 - 1,135

The difference in numbers between the two tables is the first lists only the "site occupancy" during construction, and the second table lists the total workforce considering the planned scheduled work rotation for most contractors during the construction phase will be 4 weeks on/2 weeks off. The

work-week will consist of six 10-hour days per week with a rest day on the last day of each week, or 2,080 hours annually per person, equivalent to a 40-hour week worked full time for a year.

Successful completion of the construction phase is dependent on the quality and commitment of the workforce. The construction camps will offer comfortable quarters and recreational and entertainment facilities to promote a safe, healthy, and inviting worker environment, and to encourage workers to remain within the accommodation boundaries during leisure time.

Employee transportation to the Project site will be provided by the company. Daily flights will operate between the five North Baffin community points of hire, including (listed in alphabetical order) Arctic Bay, Clyde River, Hall Beach, Igloolik, and Pond Inlet. This transport will be via small aircraft operated by current air carriers on a charter basis. Daily flights with larger aircraft, such as a Boeing 737, will operate from Ottawa to Mary River or Steensby Inlet, via Iqaluit.

5.1.2 Operation Phase Workforce

Mine operation is scheduled to begin in 2014 according to the current project schedule. The total estimated workforce during the operation phase is 765 persons, including both on-site and off-site personnel, and both Baffinland and contract personnel. This estimate does not include staffing required for any ongoing exploration work throughout the operations phase. Most on-site staff will work on a scheduled rotation of 2 weeks working at site and 2 weeks off. The Projected distribution of the workforce is as follows:

Estimated Operations Workforce Distribution (Total Payroll)

Location	# of Personnel
Toronto and Ottawa offices	50
Montreal Shipping & sales operations	10
Iqaluit office	25
North Baffin community offices	10
Mary River site	670

The above estimated numbers are from direct employment required for operations.

Accommodation facilities will be located at Mary River and Steensby Inlet, for approximately 275 and 175 persons, respectively. During operation, workers will be flown to Mary River, and rail and port employees will be transported further on a personnel rail car. Points of hire during the operation phase will be the same as the construction phase. Aircraft similar to that used in the construction phase will operate every other day basis rather than daily.

5.1.3 Closure and Reclamation Phase Workforce

The expected duration of the closure phase is three years, during which time a subset of the operation phase workforce will be retained to carry out reclamation activities at project development

areas. The details of the size and composition of the closure and reclamation workforce will be developed during the operation phase, no later than two years prior to the planned commencement of closure and reclamation activities.

5.2 EDUCATION REQUIREMENTS AND TRAINING

The network of community liaison offices (CLO) established by Baffinland during the 2007-2008 bulk sampling program will remain in place during construction and operation phases. These offices are located in (listed in alphabetic order) Arctic Bay, Clyde River, Hall Beach, Igloolik, Iqaluit and Pond Inlet. This network of CLO offices will facilitate training and employment opportunities for land claims beneficiaries and will be made available to all contractors working on the Project.

The Company has viewed its current operations as a training ground for future activities at Mary River, including mine construction and operation. The bulk sampling program in particular has been a useful opportunity to expose its current workforce to a variety of mining-related occupations. In addition to on-the-job training to date, Baffinland carried out a number of training sessions, including Workplace Hazardous Material Information System (WHMIS); First Aid; Fire Extinguisher, Fire and Emergency Preparedness; Spill Response; Archaeology; Mine Supervisor Certification; Cultural Awareness; and Heavy Equipment training. The First Aid training was also provided in several communities and was open to the general public.

Baffinland's socio-economic program is currently collecting data on baseline education and skill levels in the local communities, with the intention of assessing education and training needs for the Project. An employment skills inventory is being generated from Baffinland's current contingent of workers from the region. In March 2007, Baffinland signed a Memorandum of Understanding with the Hamlet of Pond Inlet, QIA, and the Government of Nunavut Department of Education to work together to identify people with existing skills and to identify training opportunities.

Planning for longer-term training programs is underway, so that people may obtain training and be ready for the start of mine construction in several years. Baffinland is working with stakeholders towards developing training program(s) that will prepare land claims beneficiaries for employment during the construction and operation of the Project. Training programs may include auto mechanics, welding, carpentry, word processing, heavy equipment handling, and similar skills of use during construction and operations, as well as support for professional programs such as engineering, geology, accounting, management, biology, archaeology, and human resources. Training support for jobs associated with the dedicated ship fleet will also be available.

All site personnel arriving at the Project sites currently undertake a formal site orientation program. Non-Inuit are provided a cultural awareness program as well, to build awareness and appreciation for Inuit culture as it relates to the workplace. Site orientation is mandatory for all new recruits.

SECTION 6.0 - PROJECT SCOPING

Beginning in 2005, Baffinland and its consultants have carried out a number of studies and consultations in anticipation of the NIRB environmental review process. Baffinland has expended considerable effort to engage local communities and knowledge holders, through dialogue and participation. Efforts have been and continue to be guided by the following objectives:

- To adequately scope and conduct environmental and socio-economic baseline studies
- To understand local conditions and issues, both through the scientific process as well as by engaging in dialogue with local communities and knowledge holders
- To incorporate local knowledge and concerns into Project design at an early stage
- To appropriately scope an environmental assessment of the proposed Project

This section provides an overview of the work undertaken for baseline and impact assessment scoping, the results of recent public consultation, and Baffinland's work supporting proposed zones of environmental and socio-economic influence. The outcome of Project scoping is the development of terms of reference, or Proposed Draft EIS Guidelines, for the preparation of an EIS for the Project.

6.1 BASELINE STUDIES

Areas of study have broadly included:

- Socio-economic baseline studies, including the collection of statistical data, key person interviews, and focus sessions on topics including demographics, workforce experience, health and social services, youth, education, and economic development
- Physical environment studies, including archaeology, climate, hydrology, water quality, soils, vegetation, air and noise
- Studies of terrestrial wildlife, including caribou, carnivores, birds (including raptors, geese, loons, shorebirds and songbirds), and freshwater aquatic life
- Studies of marine wildlife, including marine mammals, fish and lower trophic levels, marine and shoreline habitats

The above studies are ongoing in 2008.

6.2 INUIT KNOWLEDGE STUDIES

Inuit knowledge studies were initiated in Pond Inlet in 2006, expanded to Igloolik and Arctic Bay in early 2007, and more recently in Hall Beach and Clyde River. The overall objective of the studies has been to obtain local knowledge of wildlife, land use, and important areas to support Project decision-making and the social and environmental assessment process.

Inuit knowledge discussions held to date have informed and influenced the preceding overviews of the natural environment, local land uses, and social conditions. Information has been collected through the establishment of working groups in each community. Working groups are typically selected to represent a cross-section of people in the community with respect to sex, age, and occupation. A research agreement

between each working group and Baffinland has been established that articulates the agreed-upon study approach and intended use of the information. Knowledge has been recorded through the course of discussion in working group meetings, in individual interviews, and in the conduct of focus sessions on particular themes (e.g., caribou, marine mammals, and land use). While the focus of the Inuit knowledge studies has been to collect information, much has been learned about perspectives and key issues related to the Project. Records of meetings have been reviewed to identify key issues or concerns raised by the meeting participants. More recently, focus sessions have been carried out discussing, in addition to wildlife ecology and land use, potential Project impacts and mitigation.

6.3 OVERVIEW OF SITE CONDITIONS

The following brief overview describes the environmental setting within which the Project will be undertaken.

Natural Environment

The Mary River Project is located on northern Baffin Island, which has a semi-arid arctic climate. The average temperature at Pond Inlet, the nearest regional meteorological station with a long-term climatic record, is -15.1 ºC. The mean annual precipitation at Pond Inlet is 190.8 mm, with 143.5 cm of snowfall (equivalent to 105.4 mm of rain) and 85.4 mm falling as rain. Historical records show that snow can occur in any month, and rainfall may occur from April through November. Pond Inlet experiences 24-hour darkness (with less than 2 hours of twilight) from November 12 to January 29, and continuous daylight from May 5 to August 7.

Surficial landforms and deposits are associated with recent, widespread glaciation on Baffin Island. Surficial geology consists of locally abundant Holocene glaciolacustrine sediments, fluvial sediments (alluvial deposits), marine and glacio-marine deltaic sediments, and end moraine till, with occasional outcrops of pre-Quaternary bedrock. The North Baffin region and Mary River area lies within the Committee Belt, a granite-greenstone terrane with intermixed rift basin sediments and volcanic rocks and bounded by Precambrian mountains to the east and Palaeozoic lowland plateaus to the west. The Project lies within the zone of continuous permafrost, with an active layer thickness of up to two metres and a permafrost depth that may be as much as 700 m deep, based on extrapolation from temperature gradients measured in a 400 m-deep thermistor-instrumented drillhole.

The extremely cold temperatures of the region, combined with permafrost ground conditions result in a short period of runoff that typically occurs from June to September. All rivers and creeks, with perhaps the exception of the very largest systems, freeze completely solid or are dry during the winter months. The runoff coefficient is very high due to the combination of low temperatures, low infiltration and minimal vegetative cover, and correspondingly, surface water is abundant, and the region is dotted with thousands of small lakes and streams. Groundwater infiltration and storage in the region is limited due to the permafrost.

Surface waters in the region are neutral to slightly alkaline, with low to very low turbidity and low nutrient levels.

The vegetation of northern Baffin Island contains fewer species and typically less ground coverage in comparison with more southerly tundra environments. Vegetation communities include upland areas recently emerged from glacial ice, mixed tundra on lower slopes, heath tundra on drier slopes and sheltered banks tundra polygons on expansive lacustrine or glacio-fluvial deposits, wetlands, and riparian associations.

Terrestrial wildlife in the region is comprised of the following seven species: caribou, wolf, arctic fox, ermine, Brown and Pearyland Collared lemmings, and arctic hare. Caribou in the region are currently present at low densities, although existing trails, Inuit knowledge and harvest records indicate a much greater distribution and abundance of caribou in the past. Inuit knowledge also indicates that there potentially are three different types of caribou that can occupy the region: migratory, resident and mainland. A low density of carnivore dens in relation to widespread potential denning habitat suggests a typical low density of foxes and wolves, and a depressed prey base as well.

Notable bird use in the area consists of some flyover of migratory birds (particularly geese) moving to and from Bylot Island and an abundance of raptors and loons. Raptor nesting habitat is widespread throughout the region, and the Peregrine Falcon (subspecies tundris), which have been recovering from near extinction in the late 1960s and were upgraded from being 'threatened' to being a 'species of special concern' in 1992, are abundant throughout the region.

Baffin Island has fewer freshwater fish species than are found on the adjacent Nunavut mainland and several islands in the western Arctic. Arctic char is the most abundant and widely distributed fish species in the lakes, rivers, and streams of Baffin Island.

During the open-water period narwhal, bowhead whale, ringed seal, bearded seal, and harp seal utilize the waters of Milne Inlet and Eclipse Sound. Beluga and killer whales are also occasionally present. To the south, Bowhead whale, beluga, narwhal, and occasionally killer whales move into Foxe Basin during the open-water period. Bowhead whale in Foxe Basin congregate in an area to the north of Igloolik, near the entrance to Fury and Hecla Straits, while other marine mammal species in the area favour the western portion of the basin. During periods of ice cover, ringed seals and polar bears are common throughout the region, frequenting areas of landfast and pack ice. Polar bears have also been observed at coastal and inland locations during the open-water period. Bearded seal populations are concentrated along cracks and leads in the sea ice, along with walrus to the south throughout Foxe Basin and along the landfast ice edge at the entrance to Steensby Inlet.

Narwhal, beluga, and seals are actively harvested by Pond Inlet community members throughout Pond Inlet, Eclipse Sound and the adjacent fiords including Milne Inlet and are important cultural components and food sources for the community.

The harvest of marine mammals is also of importance to Igloolik and Hall Beach community members. Most harvest occurs along the west coast of Foxe Basin in the vicinity of the communities, but some harvest occurs throughout Foxe Basin during summer, and along the landfast ice edges including the outlet of Steensby Inlet during winter.

Lancaster Sound contains a number of overlapping conservation features, including the Bylot Island, which is a bird sanctuary, forms part of the Sirmilik National Park of Canada, and includes Important Bird Areas and International Biological Program Ecological Sites. Of these, the national park and bird sanctuary are afforded legal protections and restrictions on land use.

The Mary River Project components are removed from protected areas and known critical habitats such as national wildlife areas and critical wildlife areas. To date, ship access to the Mary River site has been through Baffin Bay and Eclipse Sound to a beach at Milne Inlet, and the shipping route to Milne Inlet passes by Sirmilik National Park and the Bylot Island Bird Sanctuary. The Milne Inlet Tote Road, originally constructed in the 1960s and currently being upgraded as part of the bulk sample program has facilitated overland access from Milne Inlet to the mine site location. The overland route south to Steensby Inlet from the mine site location and the corresponding marine transportation route through Foxe Basin is relatively removed by protected areas or known designated habitats.

Historic and Contemporary Land Use

Human habitation of the region extends back at least 4,000 years based on current archaeological data. The historic period of the North Baffin region began in the late 16th century with the first whaling and exploration in areas adjacent to Baffin Bay. Euro-Canadian exploration in the Foxe Basin area dates from the overwintering of two ships in the Igloolik area in 1822 - 1823. The Hudson Bay Company, Royal Canadian Mounted Police (RCMP), and the Catholic and Anglican Churches established themselves at different times in the vicinity of each of the existing communities, from as early as 1921 (Matthiasson, 1992). The establishment of these institutions, as with the whalers before, influenced land use and settlement patterns through the mid-twentieth century. The Distant Early Warning (DEW) line sites in Foxe Basin also influenced land use patterns. The current permanent settlements in the region occurred sporadically, mainly in response to government policy and housing initiatives in the 1960s (QIA, 2006). Land use patterns changed substantially in response to movement of Inuit into permanent settlements (Matthiasson, 1992).

There are five North Baffin communities with traditional land use ties to the Project area: Arctic Bay, Clyde River, Hall Beach, Igloolik, and Pond Inlet. Pre-settlement (1920-1960s) and post-settlement (1960s to 1974) land use is described in the Inuit Land Use and Occupancy Project (Milton Freeman Research Ltd., 1976), and has been confirmed through discussions within the communities. Each of these communities traveled and hunted within the North Baffin region. The Nunavut Wildlife Harvest Study (Priest and Usher, 2004), documenting contemporary Inuit land use, suggests that in most cases land use has become more concentrated around the communities since their establishment.

Both the North Baffin and Foxe Basin regions have been subject to scientific study for decades. Tourism activities have increased in recent years, and include local outfitting for kayaking, nature viewing, and polar bear hunting. Cruise ships also visit the North Baffin region each summer.

The North Baffin, specifically Lancaster Sound, was the focus of potential oil and gas exploration in the late 1970s. The lead-zinc Nanisivik Mine operated near Arctic Bay through the 1980s and 1990s and closed in 2002. More recently, mineral exploration activities across Nunavut, including the North Baffin region, have increased.

Parks and conservation areas are also located in the area. Sirmilik National Park of Canada (established in 2001) is one of Canada's newest national parks and covers a considerable landmass with four separate land parcels, including overlap with the Bylot Island Bird Sanctuary. Tamaarvik Territorial Park, located adjacent to the community of Pond Inlet and next to the Little Salmon River, is a local campground and park.

Social and Economic Environment

The North Baffin Region is home to a young and growing population. As of 2006, 5,387 people resided in the region, a 9.4% increase over the 2001 population. Forty-one percent of the North Baffin population is under the age of 15 years.

Inuktitut is the dominant mother tongue in the North Baffin, with over half of the population speaking only Inuktitut at home. Approximately one-quarter of the North Baffin population is comprised of unilingual Inuktitut speakers.

High infant mortality rates contribute to shorter life expectancy averages in Nunavut. Life expectancy at birth is nearly ten years less than it is across Canada. High death rates from suicide amongst young people also contribute to Nunavut's lower than average life expectancy. The major causes of death in Nunavut are cancer, suicide, heart disease, and accidents.

There is generally inadequate housing availability in local communities, as across Nunavut, with resultant overcrowding. As such, housing is a key priority for the Government of Nunavut. The proportion of home ownership by house occupants is also relatively low: less than one-quarter of families in Iqaluit and approximately one-fifth of families in North Baffin communities own their own homes.

Rates of reported crime vary across North Baffin communities, but generally fall within the middle to low range for crime rates across Nunavut.

Overall, the level of education within the population remains lower across Nunavut when compared to the rest of Canada. In Iqaluit, between half to three-quarters of Inuit have no high school diploma, and in the North Baffin, at least two-thirds of Inuit have not gained their high school diplomas. This level of high school completion in the North Baffin is similar to that seen elsewhere in Nunavut. Many Nunavummiut have pursued training outside the school system through programs provided by Arctic College, often through local Adult Learning Centres.

Incomes in the North Baffin are much lower than those in Iqaluit. While 60% of the Iqaluit population had after-tax incomes equivalent to $40,000 or more, only 20% of North Baffin residents reported this level of income. Further, 40% of North Baffin residents have incomes of less than $10,000. Income levels in Iqaluit have improved considerably across all income levels over the past decade, with the establishment of Iqaluit as the capital and government centre of Nunavut. In the North Baffin, there was little change in income levels during the years between 1996 and 2000. Improvements occurred between 2000 and 2004, however. While incomes of the higher-income families are lower in the North Baffin than in Iqaluit, the rate of increase has been similar, with the income level of the top 30% of the North Baffin residents increasing by 50%.

Across Nunavut, income is largely held by a small portion of the population. Approximately 75% of total income goes to 30% of the population. Income is somewhat more evenly distributed in Iqaluit. The North Baffin labour market supplies an estimated 1,050 to 1,250 full time or full time equivalent wage positions filled by Inuit, including 590 to 675 positions filled by Inuit males and 450 to 570 positions filled by Inuit females.

One-third of the working-aged (15+) Inuit population of the North Baffin has no involvement in the labour force while one-in-seven work full time all year round. Involvement in the wage economy is much higher in Iqaluit, with over one-third of the Inuit working-aged population working full time, all year round, and only one-quarter having no employment income. Part-time Inuit workers across the North Baffin and Iqaluit earn approximately one-third the wages that full-time Inuit workers earn.

6.4 COMMUNITIES CLOSE TO THE PROJECT

Socio-economic studies and public consultation to date have been focused on the five North Baffin communities in closest proximity to the Mary River Project components, and in Iqaluit, the territorial capital. These communities were selected based on the guidance presented in "*A Proponent's Guide to Conducting Public Consultation for the NIRB Environmental Assessment Process,"* (NIRB, 2006).

Baffinland's points-of-hire locations are communities where the Company currently operates and plans to operate direct flights to and from the Mary River site to supply workforce demands for the Project. In designating these communities as points-of-hire, there is no intention to exclude qualified workers from other communities in the region or from other parts of Nunavut. Transportation to and from the point-of-hire communities will be accomplished using commercial air carriers. These points-of-hire are based primarily on Baffinland's goal of offering preferential employment opportunities to qualified Inuit workers, through consideration of the community's existing socio-economic and/or ecosystemic ties to the Project area, followed by its geographic proximity. Each of the following communities has existing and/or historical ties to the Mary River Project area and is targeted to supply workers to the Project. Consequently, Baffinland has engaged the following communities, shown in Figure 1.1:

- **Pond Inlet** - This community is located on North Baffin Island and is the closest geographically to the Mary River mine site, located approximately 160 km northeast of Mary River. Pond Inlet relies on hunting in the marine environment of Eclipse Sound and Milne Inlet as well as caribou hunting through the Mary River area. The community currently provides supplies and employees to the Project and Baffinland has established a community liaison office (CLO) to streamline training and employment actions within the community. The CLO office will continue to coordinate employment and other community-company initiatives during all phases of the Project. Baffinland is planning to provide transportation between Pond Inlet and the Mary River site to supply Project workforce demands.

- **Igloolik** - This community is located on the mainland but is the closest community to the Steensby port site (155 km) and second closest geographically to the Mary River Site (230 km). Historically, Igloolingmiut spent the summer hunting caribou along the western side of North and Central Baffin Island. Current harvest patterns show that while Igloolingmiut utilize the Baffin coast and marine areas at the mouth of Steensby Inlet, their activities are heavily concentrated around the community on Melville Peninsula and the closest Baffin Island shoreline to the north. Igloolingmiut still hunt around

Rowley and Koch Islands and even in Steensby Inlet, and therefore the Project shipping route in this area may have both land use and ecosystemic effects on this community. Baffinland has already established a CLO office in Igloolik to organize and facilitate its employment initiatives and has retained a translator to assist with unilingual candidates speaking only Inuktitut. Baffinland is also planning to provide transportation between Igloolik and the Project site to help meet its manpower requirements.

- **Hall Beach** - This community is located on the mainland just south of Igloolik, some 192 km from the Steensby port site and 288 km southwest of the Mary River site. Hall Beach harvest patterns are distinct from Igloolik despite their proximity, with a concentration of marine harvesting centred on the Hall Beach area. Some hunting occurs on Baffin Island intermixed with Igloolik hunting, including Rowley and Koch Islands and even in Steensby Inlet, and therefore the Project shipping route in this area may have both land use and ecosystemic effects on this community. Because of its proximity to the Project area, Baffinland is planning to provide employee transportation between Hall Beach and the Project site and has already established a CLO office there.

- **Arctic Bay** - This community is located on North Baffin Island, some 280 km northwest of the Mary River site. Harvest patterns and Inuit land use patterns indicate that the effect of Project activities on current land use patterns of Arctic Bay residents is less than what it would have been historically. While Arctic Bay residents may use the Milne Inlet, Eclipse Sound and Mary River areas for hunting on a sporadic or occasional basis, other geographic areas are more important to this community's land use. However, given the past mining activity associated with the nearby and now-closed Nanisivik Mine, Arctic Bay is a good option for supplying manpower to the Project because some people in this community are already familiar with mining and have skill sets that will likely match Project needs. Consequently, Baffinland has retained a company translator in Arctic Bay and has established a CLO office to facilitate employment processes. The company is also planning to provide workforce transportation between Arctic Bay and the Mary River site to support Project needs.

- **Clyde River** - This community is also located on North Baffin Island but quite a bit further from the Project area than the other communities (415 km to the east). Historical land use information and discussions with elders from various communities suggest that the people of the Clyde River area used to travel inland from Cambridge Fiord facing Baffin Bay, into the Ravn River area east of Angajurjualuk Lake and southeast of Mary River. Harvest patterns suggest that contemporary land use activities are now concentrated closer to the community and do not extend over the mountains to the centre of Baffin Island, which is a watershed divide and appears to act as an ecosystemic boundary. However, because of its proximity and its historical ties to the Mary River area, Baffinland has established a CLO office in this community and is planning to include Clyde River as a point-of-hire community and provide transportation to and from Mary River.

- **Iqaluit** - This community is both geographically and eco-systemically well removed from the Project area, but it is already socio-economically tied to the Project. Baffinland has already established an office in Iqaluit and brings workers in to support the exploration and bulk sampling activities on a nominal three-days-per-week schedule through this community. Also, the presence of the local government agencies results in additional Project activities in Iqaluit associated with the regulatory process. The size and developed commercial economy in Iqaluit makes it a logical procurement centre and point-of-hire for the Project. Also, it is conceivable that mine employees originally based in other

Baffin communities may opt to move to Iqaluit due to its amenities and relative lower cost of living. Baffinland plans to continue to provide transportation between Iqaluit and Mary River to help supply Project workforce demands.

Other communities in the Qikiqtani Region were considered in terms of potential Project interactions, but are not likely to be directly affected by Project development. Baffinland intents to focus on the five North Baffin communities as its direct points-of-hire, although qualified workers from other Inuit communities will be welcomed to the Project workforce. The communities of Kimmirut and Cape Dorset are located on South Baffin Island, and ships associated with the Project will pass through Hudson Strait. These communities are geographically, socio-economically, and eco-systemically removed from the Project area and while Project ships pass near to the communities, a review of recent harvest data for Cape Dorset and Kimmirut show that hunting activities are very concentrated along the coast and do not extend into Hudson Strait. The ice conditions in the Hudson Strait are classified as mainly first year ice in restricted motion and as such harvesting activities are physically restricted to the near shore of the Strait because of dangerous ice conditions.

Qikiqtarjuaq, Pangnirtung, Grise Fiord and Resolute were also considered but are not likely to be affected by the Project. These communities are geographically, socio-economically, and eco-systemically removed from the Project area. All Project activities, including shipping routes, are far removed from these communities and their land use patterns do not encroach on areas that may potentially be affected by the Project.

6.5 STAKEHOLDER ENGAGEMENT ACTIVITIES

Baffinland has been proactive in engaging with a number of stakeholders to better understand their issues and concerns regarding the Project. Information and stakeholder feedback obtained through consultation has been integrated into the Project design and planning process, as broad community support is critical to the ultimate success of the Project.

6.5.1 Consultation with Potentially-Affected Communities

Consultation with local stakeholders began with the recommencement of exploration activities in 2004. Engagement activities initially focused on Pond Inlet residents, the QIA and INAC as landowner representatives, and the Nunavut Water Board to obtain and disseminate information regarding the exploration efforts and later regarding the bulk sampling plans. A summary of these consultation efforts is presented in Table 6.1. Listed meetings include those that Baffinland's consultants have held with various community groups, including elder committees, hunter and trapper organizations, and Inuit knowledge working groups. The list is not exhaustive, but gives good insight as to the nature of Baffinland's consultation efforts within the communities.

The 2007 efforts and future planned activities have been broadened in scope and outreach to include all of the six communities that are expected to be directly affected by Project implementation. Baffinland undertook its first formal public consultation on the mine Development Proposal in September 2007 to inform stakeholders and solicit public input on the plans being developed in the Definitive Feasibility Study (Aker Kvaerner, 2008). The potentially-affected

communities include the five northern communities defined in Section 6.4 and the Nunavut capital Iqaluit. The objective of these meetings was to hold dialogue with the communities, provide them with accurate information regarding the Project Development Proposal being considered, identify any issues or concerns that may be associated with the planned Project activities, and to integrate appropriate stakeholder feedback into Project decision-making.

The public meetings in the North Baffin communities were particularly well attended, and feedback on the proposed Project was balanced. Baffinland was encouraged by the level of engagement demonstrated by the communities and will look forward to continued dialogue. Records of the public meetings were translated into Inuktitut and subsequently distributed to the communities through the Hamlets. Key issues identified through these meetings focused on potential impacts to wildlife and their potential to affect food security, the opportunities for employment and the logistics thereto, the opportunity for regional economic development and the need to make sure that the IIBA agreement will benefit directly-affected local communities, the need for effective environmental controls and mine closure planning, and a desire to maintain the existing social fabric of the Inuit culture. The following sections summarize the feedback by community from these public meetings.

Clyde River - September 19, 2007

- Concern over disturbance to wildlife, including the potential for the rail line to interrupt caribou migration
- Questions about employment including: rotations; flights from communities to the Project site; minimum requirements for hiring; training; living conditions and availability of country food at site
- Whether inter-community travel is possible, given that Baffinland will be operating aircraft shuttles in the region
- An expressed interest in good communication between the Company and the community to work together to mutual benefit, with reference to poor experiences with other projects in the past
- Perspectives regarding employment – recognizing non-academic qualifications and language barriers; encouraging youth to stay in school and not quit to work at the mine
- Questions about drug testing at the job site; if past drug use will limit employment; and comments regarding the need for zero tolerance due to safety, with reference to an injury that occurred at a mine when someone was under the influence
- Questions regarding royalties and the status of negotiations of the IIBA with the QIA
- Questions about the fate of project infrastructure at mine closure, and concern that low metals prices in the future could result in closure and the loss of good jobs
- Questions about the ore geochemistry, with reference to people's knowledge of the ore at Nanisivik
- Comments regarding the potential for social and cultural changes in the community if the Project proceeds
- Questions about environmental monitoring and Inuit involvement in monitoring

Pond Inlet - September 20, 2007

- Concern over disturbance to wildlife, including air traffic disturbance to caribou at a time when the number of caribou is low; the potential for the rail line to interrupt caribou migration; and ship disturbance to narwhal
- Concern that the IIBA will not bring benefit to the community level, and an interest in indirect benefits such as community infrastructure, as an outcome of a mine
- Disappointment that Iqaluit is now the "hub" for the Project, when it was previously Pond Inlet
- The need for certainty over employment, that when people take time off that their jobs are there to go back to, with reference to previous experiences with Nanisivik and Polaris
- Questions whether or not inter-community travel would be interrupted, if Project activities will be communicated to the community, and if project sites can be used as stopping points for land users

Arctic Bay - September 24, 2007

- Concern over potential disturbance to wildlife, including low-flying aircraft affecting hunters, and shipping effects to walrus and how this will affect Igloolingmiut, with reference to shipping for Nanisivik affecting the distribution of narwhal for Arctic Bay hunters
- Questions about the potential environmental effects of explosives residue from blasting and ore geochemistry
- Questions about the potential for low ore prices to affect the mine with premature closure
- Questions about mine closure
- Inquiry if Baffinland will provide reduced freight rates as Nanisivik previously provided
- Comment regarding poor communication experienced in 2007 between workers in the community and the employer in Iqaluit, such that people have not been clear when they are to go to work and when they are to travel
- Concern over the potential for the rail line to interrupt the migration of caribou towards Arctic Bay, and whether or not compensation will be provided for lost harvests
- A comment that once the train is running, that caribou will get used to the train in the way they got used to people in the past
- Whether or not Inuit are involved in environmental monitoring
- If the company would consider funding requests, such as the capital funding contributions the Government of Nunavut provides to hamlets for infrastructure
- If Arctic Bay's co-operative will receive business like the co-operative in Pond Inlet, including the purchase of country food for workers
- If there will be a tailings pond
- A positive acknowledgement of Baffinland's work with the Inuit knowledge working groups
- Questions about worker's compensation in the case of injuries, with reference to previous experiences in the early days of Nanisivik

Igloolik

- Multiple comments regarding marine shipping through Foxe Basin, with repeated stated preference for an easterly route; a stated preference for no shipping through Foxe Basin; and one suggestion that the westerly route was better because of ice
- Questions about the viability of shipping to Milne Inlet, Cape Dorset or Nanisivik port, as alternatives to shipping through Foxe Basin
- Multiple comments regarding the changing community demographics, and the need for jobs for youth, as elders who used the land more are passing on, and that youth prefer store-bought food over country food
- Concern about dock construction at Steensby Inlet affecting the marine wildlife
- What benefits, beyond employment, will be brought to the community to help their needs
- Inquiry if businesses and schools will be built within the community, for those who want to work but do not want to leave the community
- Inquiry if inter-community travel is possible, given that Baffinland will be operating aircraft shuttles in the region
- Comments of general support of the Project, and the need for communication, which will result in cooperation and agreement and avoid problems later on
- Comment that animals are affected by hunting, and if the Project is done right, that the animals should not be bothered
- Reference to helicopters affecting hunting (without specific reference to the Project)
- A comment by a Qaatiliit Working Group member that he found during the group's site visit to Mary River that day that the site was clean, with no garbage, and the wildlife was not disturbed
- A question about compensation if the wildlife are disturbed
- Comment that Igloolik is a cultural community; whether or not IQ will be taken seriously, and that there are many social issues arising from Federal government involvement and they don't want another large social impact
- Will the soapstone at Mary River be available if mining is taking place?
- Comments that Inuit can only work 2 weeks and not for 3 months, and that because of the cost of living, working more would be better
- If there will be drilling jobs available at the mine
- Question about the purity of iron ore at Mary River, and the terminology to describe this
- What will the company do about greenhouse gas emissions

Hall Beach

- Numerous expressed interest in employment opportunities
- If Mary River soapstone will be available, and if people will need to go through Baffinland for soapstone in the future
- Multiple expressed preference for the easterly shipping route through Foxe Basin, and concern over the westerly route as it affects the area used by Hall Beach and Igloolik
- If there are targets for Inuit employment, with reference to Nanisivik's target of 60% and the actual maximum Inuit employment of 40%
- Questions about the terms of employment and conditions

- Questions about how the company will report to the community, and how often
- Question regarding land ownership at Mary River and royalties
- If there are plans in place to deal with emergency situations and wildlife
- If country food will be available to workers

Iqaluit

- A preference for the easterly shipping route through Foxe Basin
- If there is discussion with Inuit organizations about potential ownership in the Project
- If there are any important wildlife areas around the Project
- If railway options (alternatives, and alternative alignments) have been considered

Baffinland will be returning to each of these communities again in late March through early April 2008, accompanied by representatives of the QIA, to report back regarding feedback received during the September 2007 public meetings and recent permit amendments, and the Company's plans based on the DFS and presented in this Development Proposal.

6.5.2 Government and Inuit Organizations

A Mineral Development Advisory Group (MDAG) meeting, coordinated by INAC in Iqaluit, was held in June 2007. The meeting brought together a number of government agencies and Inuit organizations that may be responsible for issuing permits or approvals, and/or that will be involved in some capacity with the social and environmental assessment process. Those represented at the MDAG meeting included:

- Government of Nunavut (departments of Health and Social Services, Economic Development, Education, Finance, Environment, Community and Government Services, Executive and Intergovernmental Affairs)
- Nunavut Water Board
- NIRB
- Department of Fisheries and Oceans (DFO)
- Environment Canada
- Health Canada
- Canadian Coast Guard
- Transport Canada
- INAC
- QIA
- Nunavut Tunngavik Inc. (NTI)
- Canadian Environmental Assessment Agency (CEAA)
- Natural Resources Canada
- Parks Canada

Baffinland held a number of meetings with Inuit organizations, government agencies, and Institutes of Public Government (IPGs) through the second half of 2007, to provide the groups with an early overview of the Project, and to initiate dialogue regarding the applicable regulatory processes and information needs. Meetings were also held with Mayor and Council of each of the potentially-affected communities. Table 6.2 provides a summary of these meetings. In addition to these activities, the communities of Pond Inlet and Igloolik requested that a Baffinland executive meet with the community leaderships on a bi-monthly basis; this has been ongoing since the summer of 2007.

6.5.3 Site Visits to Mary River

Baffinland has been proactive in bringing community and government representatives to visit the operations at Mary River. As indicated in Table 6.3, representatives of North Baffin hamlets, IQ study working groups, and a number of government representatives and local community members including students have visited the Mary River operations over the past year.

6.6 TOPICS RAISED DURING CONSULTATION

Baffinland has compiled the topics that have been identified through its stakeholder engagement activities and review of the North Baffin Regional Land Use Plan, in tabular format in Table 6.4. These topics, or potential Project issues, have been derived from ongoing dialogue in IQ workshops and various meetings with Inuit organizations, government agencies, and IPGs.

Based on these inputs, along with Baffinland's and its consultants' understanding of the proposed Project, the suggested relevant baseline investigation areas for the purpose of preparing the Environmental Impact Statement consist of the following general disciplines and sub-disciplines:

- Atmosphere
  - Climate
  - Air Quality and Noise
- Land Resources
  - Landscape Terrain
  - Unique Landforms
- Surface Water
  - Water Quality and Quantity
- Groundwater/Permafrost
- Freshwater Aquatics
- Marine Environment
  - Marine Mammals
  - Shoreline/Marine Processes
  - Fish and Lower Trophic Levels
  - Water and Sediment Quality
- Vegetation
- Wildlife
  - Caribou, Birds, Carnivores
  - Critical Habitats
  - Species at Risk
- Archaeology
- Social Conditions
  - Training and Capacity Building
  - Population Demographics
  - Food Security
  - Way of Life
  - Health and Safety
  - Youth and Vulnerable Groups
- Economic Conditions
  - Employment Opportunities
  - Local Businesses
  - Revenues and Benefits
  - Services and Infrastructure
- Land Use
  - Traditional Use Areas
  - Conservation Areas and Sensitive Habitat
  - Recreation and Tourism

6.7 PROJECT ZONES OF INFLUENCE

Defining environmental and social zones of influence is fundamental to delineating the baseline study areas in advance of impact analysis. Based on the social and environmental information collected to date, Baffinland offers the following proposed study area boundaries for the EIS Guidelines:

- **Climate, Air Quality, and Noise** - These conditions are generally characterized using regionally available information coupled with Project-specific baseline data. Regression analysis is often used to correlate and calibrate longer-term regional data with site-specific data to establish a longer-term climatic baseline for use in engineering designs. Predominant wind speed and wind direction is usually used to define air quality and noise baseline study areas and for positioning appropriate monitoring stations. Also, noise and air quality study area boundaries are often defined by receptors and may be established at the Project boundary, closest point of public access, or at the nearest receptor. Given the meteorological information collected to date, Baffinland suggests that the baseline area of influence for air quality be established at a 10 km radius around the Mary River site and 10 km radius around the Steensby port site. Study emphasis should be directed along the predominant wind direction. Because noise attenuates with distance, Baffinland suggests a 3 km radius around the Project footprints as an appropriate study area.

- **Soils, Vegetation, and Physical Features** - Baseline investigations for these areas are typically limited to the immediate vicinity of the proposed Project disturbances. Buffer zones are usually established around proposed disturbance areas to understand the affects of fugitive dust fallout, accidental releases, and other potential Project-induced activities. For soils and vegetation, these zones are also influenced by the sensitivity of the habitat and variability of the species present. Based on the proposed Project footprint, the physical lay of the land, and the relatively homogenous floral habitat, Baffinland suggests that the study area for soils, vegetation, and other physical features include a 1 km buffer around all project infrastructure including camps and ports as well as a 500 m buffer along either side of the road and railway line as permitted by the terrain.

- **Surface Water and Freshwater Aquatics** - Surface water systems are typically evaluated based on watershed limits as they may be affected by Project-related land disturbances and effluent discharges. Baseline investigations should target establishing a defensible water quality and quantity profile both up-stream and down-stream from potential Project activities. Based on surface water resource information collected to date, Baffinland suggests that the study area for surface water and the freshwater aquatic environment in the Mary River area include the Mary and Tom River drainage basins as well as associated lakes and rivers. Similarly, the study area at the Steensby Inlet port site should focus on surface drainage systems upstream and downstream from Project infrastructure locations and land disturbances. For comparison, it is appropriate to obtain background information from other regional freshwater aquatic environments.

- **Groundwater and Permafrost Conditions** - Groundwater flow is typically not an issue where permafrost conditions exist. Given that the average annual temperature in the area is well below zero and site investigations at Mary River have documented permafrost to depths in the ore deposit as low as 700 m below ground surface, groundwater investigations would not be expected to be considered for this Project.

- **Birds and Terrestrial Mammals** - Birds are migratory and may pass through a project area or nest in the area from arrival to the north in the spring and migration south in early September. Direct effects to birds and wildlife are typically related through loss of habitat and sensory disturbance, so buffer zones are usually established around nesting areas, large concentrations of birds, or important wildlife areas such as dens or calving areas. To understand the relative population and distribution of wildlife populations, the study area should include a regional scope. Based on the studies accomplished to date, Baffinland suggests a 50 km wide study area which is centred on the alignments of the Milne Inlet Tote Road and the proposed railway, from Milne Inlet to Steensby Inlet. Bird studies should also be extended into the coastal environment at Milne and Steensby Inlets.

- **Marine Mammals and Aquatics** - The marine aquatic environment has the potential to be affected in the vicinity of the port site. Direct effects to marine wildlife are typically related through loss of habitat and sensory disturbance, so buffer zones are often also established along shipping lanes. To understand the relative distribution of wildlife populations, the study area should also include a regional scope. Based on information collected to date, Baffinland suggests that the study area for year-round shipping cover Northern Foxe Basin from Steensby Inlet to where the shipping route deviates from established shipping lanes accessing Hall Beach and Igloolik. The study area should be inclusive of land use areas of Igloolik and Hall Beach to understand potential Project interactions with land use. Because Milne Inlet is already used for shipping during the open water season, which will also be the case for Project shipments, Baffinland suggests that the study area at Milne be confined to the Inlet area only.

- **Cultural Heritage and Archaeology** - Cultural heritage and archaeology are a blend of Inuit knowledge and physical artifacts that have remained from ancestral use of the land. Physical artifacts are affected by land disturbing activities and as such, Baffinland recommends that the study area for archaeological assessment include the footprint of the mine, camp, and processing facilities surrounded by a 100 m buffer. Regional desk studies may assist with the understanding of local cultural resource finds within the study area and may affect cumulative assessment findings as well as the need and procedures for data collection and recovery where existing resources may conflict with Project development plans. With regard to Inuit traditional knowledge, Baffinland suggests that traditional knowledge be collected from communities which have a historical tie to the Project development area, including Pond Inlet, Arctic Bay, Clyde River, Igloolik, and Hall Beach.

- **Social and Economic Evaluations** - The social and economic conditions of the potentially-affected communities should be profiled so that Project-related impacts and benefits can be evaluated as part of the review. As previously discussed, Baffinland recommends that the communities of Pond Inlet, Arctic Bay, Clyde River, Igloolik, Hall Beach and Iqaluit be included in the Project's social zone of influence.

6.8 PROPOSED DRAFT EIS GUIDELINES

One of the key steps in the Part 5 review process is NIRB's development of guidelines for the development of an Environmental Impact Statement (EIS). Proposed Draft EIS Guidelines have been developed by Baffinland through its own familiarity with the Project and Project site, its own scoping activities, consultation with communities, and referral to EIS guidelines developed for other mining projects. The draft guidelines are based on the Project information presented in Sections 2, 3, and 4; the topics identified through stakeholder engagement as summarized in Table 6.4, and Baffinland's preceding suggestions regarding appropriate social and environmental zones of influence. Baffinland is providing these guidelines for NIRB's, NPC's and the NWB's consideration for adoption in whole or in part, to facilitate scoping and the development of NIRB-issued guidelines for a Part 5 review.

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