Mary River Project

2012 Work Plan

Attachment 8

Borrow Pit and Quarry Management Plan

2011-12-09	B	Approved for Use	A. Grzegorczyk	J. Binns	S. Perry	
2011-11-03	A	Approved for Use – Environmental Permit	J. Donetz	J. Binns	J. Casson	
DATE	**REV.**	**STATUS**	**PREPARED BY**	**CHECKED BY**	**APPROVED BY**	**APPROVED BY**
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1. Introduction

1.1 Purpose and Approach

This management plan is prepared within the context of the Baffinland Mary River Draft Environmental Impact Statement (DEIS), and is meant to provide supporting information for consideration towards the 2012 Work Plan for the Project. A more complete 2012 Work Plan description of all components can be found in the 2012 Work Plan and further management plan descriptions in Attachment 8 of the 2012 Work Plan. The purpose of the Borrow Pit and Quarry Management Plan is to set out the objectives and measures to maintain and enhance environmental performance of the quarries while avoiding to the extent practical, remedying, and mitigating any potential adverse environmental effects associated with quarrying.

The goal of this Management Plan for the 2012 Work Plan is to provide regulators with an overview of the management principles that will govern the quarry operations necessary for the Mary River Project during 2012 Work. In total, 67 quarries will be required during the Project lifecycle for railway and road construction, plus additional material for infrastructure, however only Mary River Mine Site (QMR2) quarry would be developed in 2012 Work Rather than evaluating separate management plans for each site, it was agreed that this overall management strategy would be prepared, and that a more detailed description of quarry operations would be provided for each quarry. Since only Mary River Mine Site (QMR2) Quarry will be developed during 2012 Work this Site Description and Operations Plans is presented in Annex 3.

Although the terrain differs over the entire RSA, it should be noted that the actual quarry management strategy will remain relatively constant. All quarries will be blast/crush types of operations, with an attempt to minimize the creation of depressions that would permanently alter water regimes. All quarries will avoid, as much as is practical, sensitive areas and features. All quarries will be relatively free of spoils piles, due to the limited soil overburden throughout the area.

Figure 1-1 shows the location of all quarries under consideration for the Mary River Project, and Table 1-1 summarizes the quarry yields (where available).

1.2 Regulatory Requirements

Under the guidelines provided by the Nunavut Water Board (NWB), quarrying is not specifically listed as an activity that requires a Type A license. Under Guideline 3 Activities Requiring License Types, Table 2: Summary of Type B and A Water License Criteria pursuant to the Regulations, IndustrialUndertakings,3(c)), quarrying is listed as only requiring a Type B License.

The Mary River borrow pit or quarry development requires a quarry permit under the Territorial Quarrying Regulations, and if activities include the use of equipment that exceeds the thresholds of the applicable land-use regulations, a land-use permit is required. Both permits include terms and conditions specifying how operations must be conducted. A quarry lease may be applied for instead of a quarry permit if longer-term tenure is desired.

Quarry operations that require blasting might require regulatory approval from the Worker's Safety and Compensation Commission.

1.3 Baffinland's Commitments

Baffinland provides adequate resources to implement and maintain the Environmental, Health, and Safety (EHS) Management System including the necessary human, material and financial resources.

Baffinland's Sustainable Development Policy is included in Annex 1.

1.4 Application of this Management Plan

Aggregate requirements for the Mary River Project are described elsewhere in this document and will be supplied by the quarry site located at Mary River (QMR2). Section 2.1.6 of the FEIS describes the overall strategy for sourcing aggregate. The following summarizes the sources and applications.

Aggregate will be used during construction activities at the Mary River Mine Site as fill material for the Mary River Fuel Farm containment area. The aggregate will be obtained from borrow sources located within the PDA and pit overburden and rock quarries at a location outlined in Annex 3.

Results of geochemical testing conducted to date for acid rock drainage and metal leaching indicate that quarry materials have low potential for acid generation (ARD) and metals leaching (See FEIS Appendix 6 B-2). Geotechnical drilling samples have been obtained for all sites, or are in the process of being obtained (Table 1-1). No ARD issues have been noted. Any acid rock generating sites will be deemed as unusable for quarry applications.

This Pit and Quarry Management Plan will be updated to reflect situations related to incident investigations, regulatory changes, or other Project-related changes. Start of the construction phase will be a major milestone for the Project.

1.5 Relationship to other Management Plans

This plan should be viewed in concert with the following additional management plans prepared for the 2012 Work Plan. All management plans can be found in Appendix B under their respective headings as follows:

- Emergency and Spill Contingency Plan;
- Site Surface Water and Aquatic Ecosystems Management Plan;
- Wastewater Management Plan;
- Explosives Management Plan; and
- Abandonment and Reclamation Plan.

In addition, completed management plans as described in the FEIS should be consulted if other details are required.

2. Targeted VEC's

Valued Ecosystem Components (VECs) were established in the studies and evaluations related to the FEIS. For the construction work, targeted VECs for the Pit and Quarry Management Plan are:

1. Health and safety (compliance with Baffinland's Health and Safety Management Plan);
2. Surface water quality;
3. Air quality, noise, and vibration; and
4. Terrestrial wildlife.

3. Mitigation Measures

3.1 Planning and Design

Potential borrow pit and quarry sites have been identified for each area of the construction works for the Project. These sites are located in the footprint of Project facilities.

Appendix 10-D-6 of the FEIS provides further location information and includes quarry boundaries, distances from creeks and streams (31-m setback), presence of bird-nesting areas, and potential tonnage.

The requirement for a 31-m setback from creeks or streams will ensure minimal adverse impacts of the pit/quarry operation on surface water quality. A similar setback is required from known bird-nesting locations.

An important aspect of planning is to assess suitability of quarry material. Baffinland will avoid using quarry material that has the potential for generating Acid Rock Drainage (ARD). Geotechnical investigations have been carried out at the proposed sites, and ARD sources are being avoided. A protocol for ARD sampling is attached to this Plan (see 0).

3.2 Environmental Concerns and Mitigation Techniques

Environmental concerns for all Project works, including the quarries and borrow areas, are presented in Volume 6 to 8 of the FEIS. Table 3-1 below presents a summary of environmental concerns and mitigation techniques associated with development of borrow pits and quarries.

Table 3-1 Pit and Quarry Environmental Concerns and Mitigation Techniques

Development Phase	Activities	Potential Environmental Effects	Mitigation Techniques
Site layout/ Site preparation	• Timber clearing • Vegetation removal • Soil and overburden removal	• Soil erosion • Habitat loss	• Retain vegetation to maintain slope stability • Maintain natural drainage patterns • Maintain vegetation buffer zones to protect water bodies • Construct ditches to direct runoff away from site • Locate the development in a well-drained area • Salvage and properly store organics, topsoil, and overburden for use in reclamation
Operations/ Monitoring	• Blasting • Stockpiling • Crushing • Access road maintenance	• Soil erosion and sediment deposition	• Limit sediment movement using silt fences or straw bales • Use rip-rap to reinforce drainage channel corners and water discharge points • Revegetate where required to stabilize slopes
		• Water quality impacts: ○ Silt ○ Fuel ○ Blasting residue	• Limit sediment movement or use settling ponds before discharging • Use proper fuel containment and handling techniques, and have spill kits accessible • Use proper explosives handling techniques to minimize wastage
		• Water Ponding: ○ Permafrost degradation	• Minimize sources of in-pit water by diverting surface water away from the development area • Place ice-rich material to thaw in a location where melt water will not re-enter pit • Limit pit or quarry depth
		• Dust generation	• Spray water and use dust skirts on conveyors to minimize dust

Source: Northern Land Use Guidelines, Pits and Quarries, INAC 2008

3.3 Development Plans of Borrow Pit and Quarry

A detailed development plan will be prepared by the selected contractor before the start of extraction of material from each borrow pit or quarry. Site development plans will augment this operations plan with specific details. These development plans will include:

- Site layout and boundaries with the following provisions:
  - Minimum setback of 31m from environmentally sensitive areas;
  - Adequate room for all activities;
  - Estimates of the resources to be extracted;
  - Refuelling station with appropriate containment (if required);
  - Stockpiling location;
  - Dust and noise consideration;
  - Waste management; and
  - Water management structures.

- Sequence of operation:
  - Contractor involved in the operation;
  - Site operating procedures; and
  - Spill response procedures.
- Monitoring:
  - Pit wall stability (for quarry);
  - Extent of permafrost or ground-ice;
  - Wildlife interactions or sightings; and
  - Contingencies if changes to the original development scenario are required.
- Reclamation:
  - Overburden replacement for site grading and re-contouring;
  - Reclamation of natural drainage;
  - Slope reconstruction;
  - Removal of all garbage and debris;
  - Removal of all temporary storages/structures/equipment;
  - Reclamation of access road and block access (if required); and
  - Replacement of all salvaged topsoil (if required).

3.4 Water Management

Site development must ensure positive drainage to prevent water pooling or flooding of the pit. The following measures will be implemented to enhance re-establishment of equilibrium and minimization of erosion and water ponding:

- Where possible, excavations will be minimized by utilizing above grade sources for material (hills and swales), which will minimize water collection and drainage disruption;
- Cut and fill areas will be stabilized by constructing gentle slopes less prone to erosion.
- Cut and fill areas are expected to be relatively small in horizontal and vertical extent. The side slopes of the borrow pits will be 1H:1V to 2H:1V, slightly gentler than natural slopes to reduce erosion;
- In low-lying areas where roadbed fill is in the order of 1 m and permafrost can be expected to rise to a meaningful degree, swales or culverts will be installed as part of road maintenance to prevent water ponding;
- At closure, swales will be left in place, or alternatively, the road bed will be breached to allow drainage;
- Borrow activities will be concentrated in few areas to limit the area of disturbance;
- Thawed layers will be removed sequentially;

- Areas of unexpected settlement will be filled to re-establish natural contours and eliminate water ponding; and
- Borrow locations will be regularly inspected and unstable slopes regraded to eliminate depressions and re-establish natural drainage patterns.

3.5 Resource Extraction

Extraction methods will depend on the nature of the material, equipment used, and extent and nature of the permafrost.

Pits and quarries will not be excavated below the water table. If excavated material contains ground-ice, the material will be stored at a location in the pit where it can thaw and drain. Meltwater from such stockpiles must be treated for sediment control (see Attachment 8, Surface Water and Aquatic Ecosystems Management Plan).

Machinery and equipment used on the site will be serviced on a routine maintenance schedule to ensure proper operation and thus minimize emissions and noise.

If fuel storage is required, fuel tanks must be double-walled and placed within a containment berm. A well-stocked spill response kit must be placed in the refuelling area. Vehicles must be equipped with spill response kits and drip trays. Used oil and fuel must not be stored at the pit/quarry sites.

A spill contingency plan must be in place for each quarry site. This plan outlines the logical order of how operators should respond to spills, resources available onsite for spill response, and notification procedures.

3.6 Closure

The abandonment of the Project works and site reclamation for the quarries and borrow pits will be undertaken at the close of the Project. The works will be integrated into the overall Project Abandonment and Reclamation Plan, although separate closure plans for each quarry and borrow pit will be required. Closure of the Project will involve removing construction materials, equipment and infrastructure and reclaiming the site to self sustaining productive ecosystem near its original condition.

In addition to the measures described in Section 3.1 to Section 3.5 above, the general abandonment and reclamation plans include the following:

- Dismantle and transport all fuel/chemical storage and handling infrastructure to an approved facility or for reuse where applicable;
- Dismantle and remove all buildings and related infrastructure;
  - Any remaining concrete piles will be cut to below grade and covered with overburden.
- Dismantle water and sewage treatment plants for reuse or disposal at an approved facility;
- Remove all hazardous waste and explosives;

- Regrade as necessary to establish safe slopes and restore the natural drainage to the area; and
- Test soils and granular materials for hydrocarbon content; contaminated soils will be remediated.

4. Roles and Responsibilities

The quarries and borrow pits described in this document are being exploited for specific construction activities related to the Mary River Project. Although there is the potential for the quarries to continue operating as part of the overall Project development, there is no current commitment past those outlined for the Mary River Project, and no general commercial operation is anticipated.

4.1 Baffinland Personnel

The Manager for Sustainability is responsible for implementing Baffinland's EHS policies and environmental management plans, and for ensuring that the EPCM contractor and subcontractor have the organization, policies, and operating practices in place to ensure ongoing compliance with Baffinland's EHS requirements.

4.2 EPCM Contractor

The EPCM contractor is responsible for:

- Preparing necessary documentation for permitting of quarries and borrow pits;
- Selecting the subcontractors who will undertake development of borrow pits and quarries;
- Ensuring that subcontractors comply with Baffinland's health and safety policies;
- Daily supervision and monitoring of subcontractors to ensure compliance with regulatory requirements; and
- Reporting to Baffinland as required.

Before material extraction from a borrow pit or quarry sites, the EPCM contractor will submit a detailed pit/quarry development plan to Baffinland (see Section 3.3).

5. Performance Indicators and Thresholds

The performance indicators for the pit/quarry are visual and depend on regular inspection and maintenance of the pit/quarry site. These indicators are:

- Site safety and security;
- General site condition and "housekeeping";
- Positive drainage and absence of water pooling/ponding on the pit/quarry site; and
- Ground/slope stability.

6. Monitoring and Reporting Requirements

Operation of the borrow pits and quarries must be monitored to ensure they are proceeding according to the Borrow Pit and Quarry Management Plan and remain in compliance with regulations and land-use permits. Monitoring focuses on:

- Regular inspection of site-preparation measures:
  - Site safety and security; and
  - Site maintenance and general housekeeping conditions.
- Regular inspection of drainage and water management structures and assessment of their effectiveness;
- Determining if the granular resource material is still suitable for end-use;
- Establishing how much ground-ice is present in the material and behaviour and volume loss of the material as thawing occurs;
- Inspecting records of wildlife interactions and sightings; and
- Reporting quantities of material extracted.

Site monitoring is required for several years after closure to assess whether reclamation objectives have been met. Post-closure monitoring requirements will be specified in the land-use permits.

7. Adaptive Strategies

Baffinland is committed to continuous improvement in its work activities with the aim of reducing risks to the environment and improving operational effectiveness. All development activities will be subject to this approach, and will focus on the outcome of the overall 2012 Work Plan. All works will need to fit seamlessly into the overall Project plans. The strategy at Baffinland is regular monitoring supported by operational change and adoption of other mitigation measures if warranted.

As per the requirements of Baffinland's EHS Management Framework, the company will conduct and document regular management reviews of its Borrow Pit and Quarry Management Plan. Such reviews will ensure monitoring results for the Borrow Pit and Quarry Management Plan are integrated with other aspects of the Project and that necessary adjustments are implemented as required. These reviews also provide a formal mechanism to assess effectiveness of management in achieving company objectives and maintaining ongoing compliance with Project permits and authorizations.

8. References

1. Northern Land Use Guidelines, Pits and Quarries, INAC 2008;
2. Drawing #H337697-7000-10-014-1101;
3. Drawing #H337697-7000-10-014-1102; and
4. Drawing #H337697-7000-10-014-1107.

Figure 8-1 Quarry Locations (from Baffinland Iron Mines FEIS, Volume 3, Figure 3-2.4)

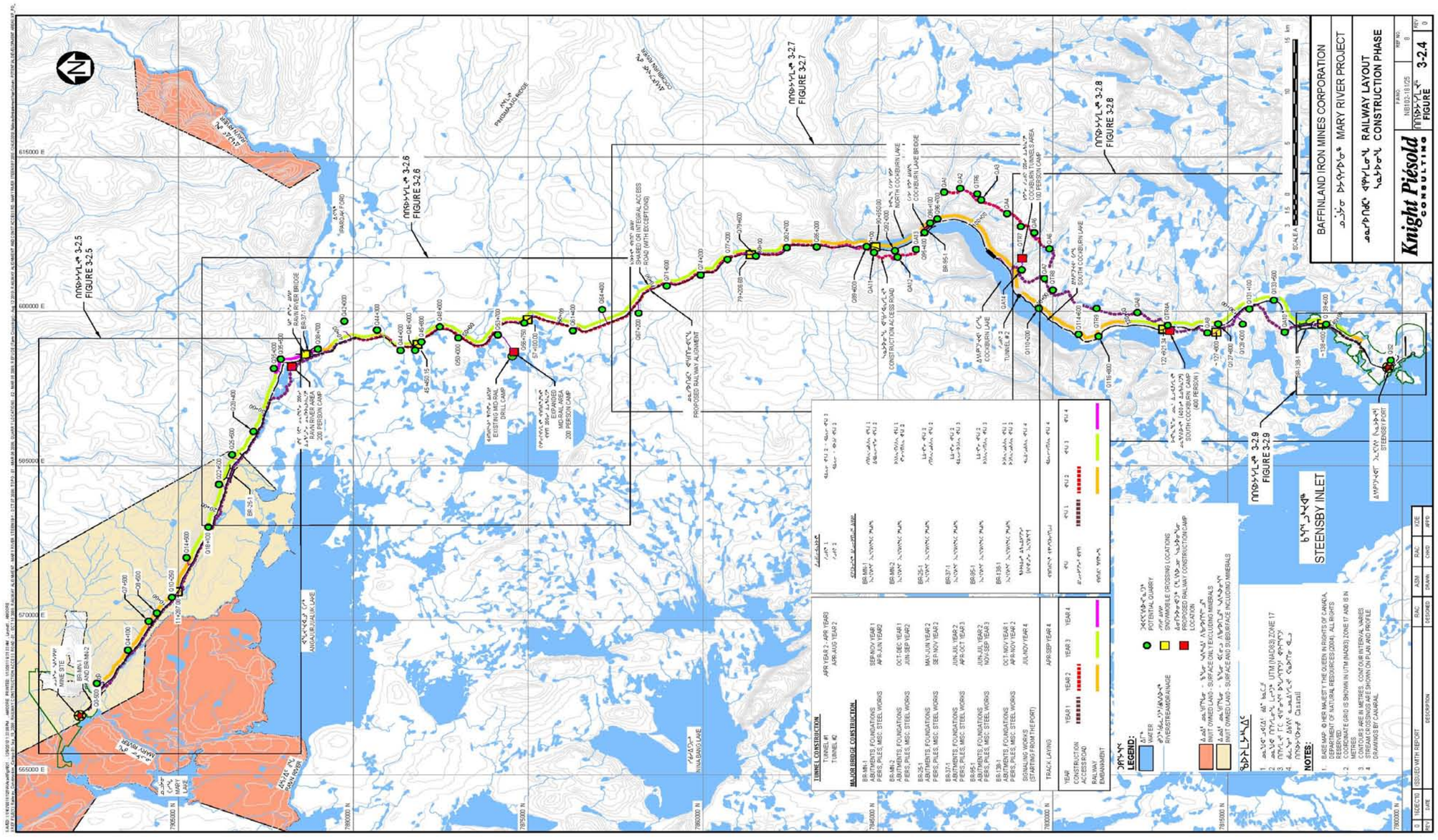

Table 8-1 Yields for Quarries for Mary River Project

Quarry Name	Railway Borrow Volume (m3)	Road Borrow Volume (m3)	Total Borrow Volume (m3)	Northing	Easting	Drilled	No. of Boreholes
QMR2	347,284	35,048	382,332	7914534	560205	Y	1
Q-0 + 500	287,589	96,030	383,618	7911899	563668	Y	2
Q4 + 100	383,271	130,194	513,465	7909418	566698	Y	2
Q7 + 500	87,805	43,250	131,055	7907667	569432	Y	1
Q10 + 250	680,287	132,056	812,344	7905378	572883	Y	2
Q14 + 500	566,692	105,879	672,571	7904382	575868		3
Q18 + 100	650,511	137,078	787,589	7902853	578804	Y	1
Q22 + 500	1,059,195	147,851	1,207,046	7901663	583415	Y	3
Q25 + 500	200,491	28,384	228,875	7900221	586954		2
Q28 + 400	49,860	44,984	94,845	7898617	588240	Y	1
Q31 + 500	17,560	90,500	108,060	7897863	590944	Y	1
Q35 + 000	21,733		21,733	7896866	594445	Y	1
Q35 + 500	94,917	31,786	126,702	7896244	595477	Y	1
Q38 + 700	285,543	82,273	367,816	7893140	596368	Next	1
Q40 + 600							1
Q42 + 000	19,812	37,229	57,041	7890881	598151	Y	1
Q44 + 300	285,186	35,532	320,718	7888054	598208	Y	1
Q44 + 000	15,655	16,076	31,731	7885927	596138	Y	1
Q45 + 000	39,801	10,179	49,980	7884724	596201	Next	1
Q45 + 800	14,467	21,606	36,073	7884147	596990		1
Q48 + 000	0	31,469	31,469				1
Q50 + 000	42,014	32,249	74,264	7881100	597357		1
Q53 + 700	185,801	45,547	231,348	7877567	597616		1
Q56 + 750	264,917	33,356	298,273	7875280	598852		1
Q60 + 000	138,196	63,076	201,273	7871954	599087		1
Q64 + 400	112,951	44,658	157,610	7868565	600221	Y	1
Q67 + 200	43,696	37,520	81,216	7865619	600161	Y	1
Q71 + 000	113,113	39,421	152,534	7863169	602398	Y	1
Q74 + 200	53,306	27,469	80,775	7860226	603469		1
Q77 + 200	0	31,964	31,964	7857588	604840		1
Q79 + 600	120,013	40,568	160,581	7855411	605366		1
Q82 + 700	50,075	42,131	92,206	7852449	605710		1

Quarry Name	Railway Borrow Volume (m3)	Road Borrow Volume (m3)	Total Borrow Volume (m3)	Northing	Easting	Drilled	No. of Boreholes
Q85 + 200	113,221	55,567	168,787	7850087	606073		1
Q88 + 800	179,226	25,128	204,354	7846674	605956	Y	1
Q92 + 000	4,629		4,629	7843535	605816	Y	1
Q95 + 400	8,091	19,533	27,624	7840905	607500		1
Q96 + 100	12,986	66,030	79,016	7840533	608580		1
Q96 + 700	0		0			Next	1
Q110 + 200	220,498		220,498	7831193	600359		1
Q114 + 600	66,623		66,623	7827828	597850	Y	1
Q116 + 800	411,258		411,258	7826194	597422	Y	1
Q127 + 800	225,332		225,332	7815755	598770		1
Q128 + 000	56,668		56,668	7813922	598828		1
Q131 + 100	0	116,233	116,233	7813509	600177		1
Q133 + 500		353,414		7811052	601482		1
Q138 + 100	0	36,206	36,206	7807612	598865		1
Q139 + 600	0	44,235	44,235	7806105	598727		1
QTR21		22,175	22,175	7845379	605707	Y	1
QTR22		33,000	33,000	7843330	605243	Y	1
QTR23		7,190	7,190				1
QTR10		147,469	147,469	7839328	611431		1
QTR11		45,194	45,194	7838013	611995		1
QTR6		31,009	31,009	7836409	611377		1
QTR12		94,812	94,812	7836190	610857		1
QTR13		103,448	103,448	7833967	609448		1
QTR7		29,309	29,309	7832685	608302	Y	1
QTR14		103,145	103,145	7831608	607681		1
QTR15		106,996	106,996	7830326	606224	Y	1
QTR16		292,157	292,157	7830731	603228		1
QTR17		827,772	827,772	7832759	604006		2
QTR8		86,025	86,025	7830182	602012	Next	1
QTR9		206,449	206,449	7826260	600261	Y	1
QTR18		225,058	225,058	7822808	599870	Y	1
QTR4A	639,771	416,575	1,056,347	7820458	598730	Y	3
QTR19		214,987	214,987	7816806	597863	Y	1

Quarry Name	Railway Borrow Volume (m3)	Road Borrow Volume (m3)	Total Borrow Volume (m3)	Northing	Easting	Drilled	No. of Boreholes
QTR20		93,345	93,345	7810467	598087	Y	1
QS1				7803054	593500	Y	1
QS2				7801066	595200	Y	1
QS3A				7800000	595698		1

Annex 1

Baffinland's Sustainable Development Policy

At Baffinland Iron Mines Corporation, we are committed to conducting all aspects of our business in accordance with the principles of sustainable corporate responsibility and always with the needs of future generations in mind. Everything we do is underpinned by our responsibility to protect the environment, to operate safely and fiscally responsibly and to create authentic relationships. We expect each and every employee, contractor, and visitor to demonstrate a personal commitment to this policy through their actions. We will communicate the Sustainable Corporate Policy to the public, all employees and contractors and it will be reviewed and revised as necessary on an annual basis.

These four pillars form the foundation of our corporate responsibility strategy:

- Health and Safety
- Environment
- Investing in our Communities and People
- Transparent Governance

1.0 HEALTH AND SAFETY

- We strive to achieve the safest workplace for our employees and contractors; free from occupational injury and illness from the very earliest of planning stages. Why? Because our people are our greatest asset. Nothing is as important as their health and safety.
- We report, manage and learn from injuries, illnesses and high potential incidents to foster a workplace culture focused on safety and the prevention of incidents.
- We foster and maintain a positive culture of shared responsibility based on participation, behaviour and awareness. We allow our workers and contractors the right to stop any work if and when they see something that is not safe.

2.0 ENVIRONMENT

- We employ a balance of the best scientific and traditional Inuit knowledge to safeguard the environment.
- We apply the principles of pollution prevention and continuous improvement to minimize ecosystem impacts, and facilitate biodiversity conservation.
- We continuously seek to use energy, raw materials and natural resources more efficiently and effectively. We strive to develop pioneering new processes and more sustainable practices.
- We understand the importance of closure planning. We ensure that an effective closure strategy is in place at all stages of Project development and that progressive reclamation is undertaken as early as possible to reduce potential long-term environmental and community impacts.

3.0 INVESTING IN OUR COMMUNITIES AND PEOPLE

- We respect human rights and the dignity of others. We honour and respect the unique culture, values and traditions of the Inuit people.
- We contribute to the social, cultural and economic development of sustainable communities adjacent to our operations.
- We honour our commitments by being sensitive to local needs and priorities through engagement with local communities, governments, employees and the public. We work in active partnership to create a shared understanding of relevant social, economic and environmental issues, and take their views into consideration when making decisions.

4.0 TRANSPARENT GOVERNANCE

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

Tom Paddon
President and Chief Executive Officer
September 2011

Annex 2

Acid Rock Drainage Testing Protocol

Acid Rock Drainage Testing Protocol

Introduction

The production or collection of acid rock drainage (ARD) as a result of construction of the rail bed and temporary access road may become an issue for the Mary River Project. Quarry sites used for the production of rock fills or rip rap materials may be susceptible to the production of ARD.

In order to reduce or eliminate the potential for this situation to occur, the following protocol has been developed.

Sampling

There are no strict guidelines for establishing sampling protocols (Vallee, 1999). However, the unique setting of the Mary River Project dictates that sampling for exclusion is the most appropriate action.

In this regard, all potential quarry sites will be evaluated for the potential production of ARD. The proponent (Baffinland Iron Mines) will require that a representative test sample of the quarry be analyzed for the potential to produce ARD. A professional engineer or geoscientist (P.Eng. or P.Geo.) will be engaged who is responsible for field mapping of the quarry, collecting the representative rock sample from the areas of the quarry specifically being developed, completing a mineralogical assessment of the potential for ARD conditions, and, if required, commissioning the necessary laboratory tests to evaluate the potential for ARD. A report summarizing the results of the evaluation is to be certified by the registered professional and presented to the regulators. The professional is responsible to ensure that the evaluation reasonably represents the conditions within the currently proposed quarry development areas.

Sample Analysis

The following standard analytical procedures are required for ARD prediction:

Initially, an assessment must be conducted to determine whether or not any sulphate or acid producing mineralogy is present within the rock.

1. Where acid production is deemed possible from the assessment, then a representative sample should be collected and acid-base accounting tests conducted to include:

i. total sulphate and sulphide-sulphur;

ii. bulk neutralization potential;

iii. carbonate content; and

iv. pH.

Where, one or more positive tests indicate that ARD is likely occur, then the quarry site will automatically be eliminated from the development schedule, and an alternative site will be located to supply the necessary materials for rail bed construction.

Accepted test methods for acid base accounting could include:

- Sobek, et al 1978 – EPA 600/2-78-054; and
- Coastech, 1989 - Modified Acid Base Accounting.

2. Where the initial assessment determines that mineralogy does not appear to support potential for ARD, a sample will be taken regardless. Analysis will be at the discretion of the professional engineer or geoscientist in charge of the program.
3. Once quarries are under development, if, in the opinion of the professional engineer or geoscientist in charge of the program, there is cause for further testing, then such tests will be designed and carried out as required.
4. All results will be forwarded to the appropriate regulatory agencies.

Literature

- Vallee, Marcel (1999), Sampling Quality Control, Exploration and Mining Geology, vol.7, nos. 1 and 2.
- Sobek, A.A., Schuller, W.A., Freeman, J.R. and Smith, R.M. (1978), Field and laboratory methods applicable to overburden and minesoils, EPA 600/2-78-054, 203pp.
- Coastech Research (1989), Investigation of Prediction Techniques for Acid Mine Drainage, MEND Project Report 1.16.1a, MEND, Ottawa, Ontario.

Annex 3

Mary River Mine Site – Site Description and Quarry Operations Plan

1. Introduction

The Mary River Iron Ore Project requires a number of separate infrastructure components to be completed as part of the 2012 Work in anticipation of the eventual Project Approval. The need for aggregate resources for 2012 Work necessitates the opening of a quarry at Steensby. This document outlines the Site Description and Operations for the quarry for the 2012 Work phase of the Project only.

1.1 Need for an Operations Plan

The guidelines provided by the Nunavut Impact Review Board (NIRB) and Indian and Northern Affairs Canada (INAC) with regards to a Quarrying Permit Application state:

5. A Quarry Operations Plan is required with (this) application and must be approved by a Land Use Inspector prior to approval and issuance of the quarry permit if:

   a) The volume being applied for is greater than 1,000 m^3 and/or;

   b) The quarry site is being operated by multiple users.

The proposed quarry at the Mary River Mine Site will exceed the volume threshold of 1000 m3, and a plan is required. This plan should be used in conjunction with the 2012 Borrow Pit and Quarries Management Plan, and other plans referred to in the document.

1.2 Site Description

The following physical description and environmental setting are summaries from the Mary River Draft Environmental Impact Statement (DEIS). For a more complete description, refer to Section 15 and 16 of the 2012 Work Application, and Baffinland Iron Mines Corporation, Draft Environmental Impact Statement, Jan 2011, Volumes 6, 7, and 8.

1.3 Site Physical Description

The layout for the proposed Mary River Mine Site Quarry is shown in Figure 1. The basic quarry specifics are shown in Table 1 below:

Table 2: Mary River Mine Site Quarry Specifications

Requirement	Description
NTS Map Sheet (1:50,000)	• 37 G/2 Edition 1 ASE Series A 713
Quarry Coordinates (UTM)	• 560000E 7914271N (centre point) • 559415E 7914286N (W extent) • 560515E 7914387N (E extent) • 560046E 7914047N (S extent) • 560144E 7914596N (N extent)
Total Area of Quarry	• 252,704 m^2
Area of Existing Clearing	• No clearing is required as site is primarily exposed rock
Area of Proposed Quarrying	• Figure 1 shows the quarry extents
Topsoil/Overburden Storage Area	• None is required as site is primarily exposed rock
Access Roads/Trails	• No roads currently exist to the site. As part of the 2012 Work temporary access roads will be constructed as shown in Figure 1
Camp Locations	• No camp will be built specifically for the quarry operation. Personnel will be housed at the existing Mary River camp

Topography varies considerably across the Project area. Topography at the Mary River Site in the vicinity of the proposed quarry is described as quickly rising to 679 m asl from the fairly flat and sandy outwash plain at 188 m asl where the exploration camp is currently located. The land to the west is equally mountainous with some minor coverage of glaciers. There are several elevated plateaus to the east formed by horizontal sedimentary deposits.

Valley walls are generally steep and abrupt, often with distinct terraces.

Near surface bedrock is dominant in the quarry area. Limited overburden is in the form of marine sediments and localized deposits of till. The majority of the overburden is located in depressions between the numerous bedrock outcrops and is typically overlain by a layer of vegetation and boulders. This is evident along the base of the rock outcrops at the quarry site.

The Project is located in a zone of continuous permafrost. The active layer through the Project area typically ranges from approximately 1 m to 2 m but may be greater in areas where there is loose, sandy soil at the edges of lakes or ponds and less in areas with a substantial surface layer of wet organics. The proposed quarry site has areas where permafrost would be encountered. These are primarily in the deposition areas and deposits to the south of the actual site can range up to 30 m in depth with ice rich deposits.

Other Project-related infrastructure in the Mine Site area will be located on areas of glaciofluvial terrace.

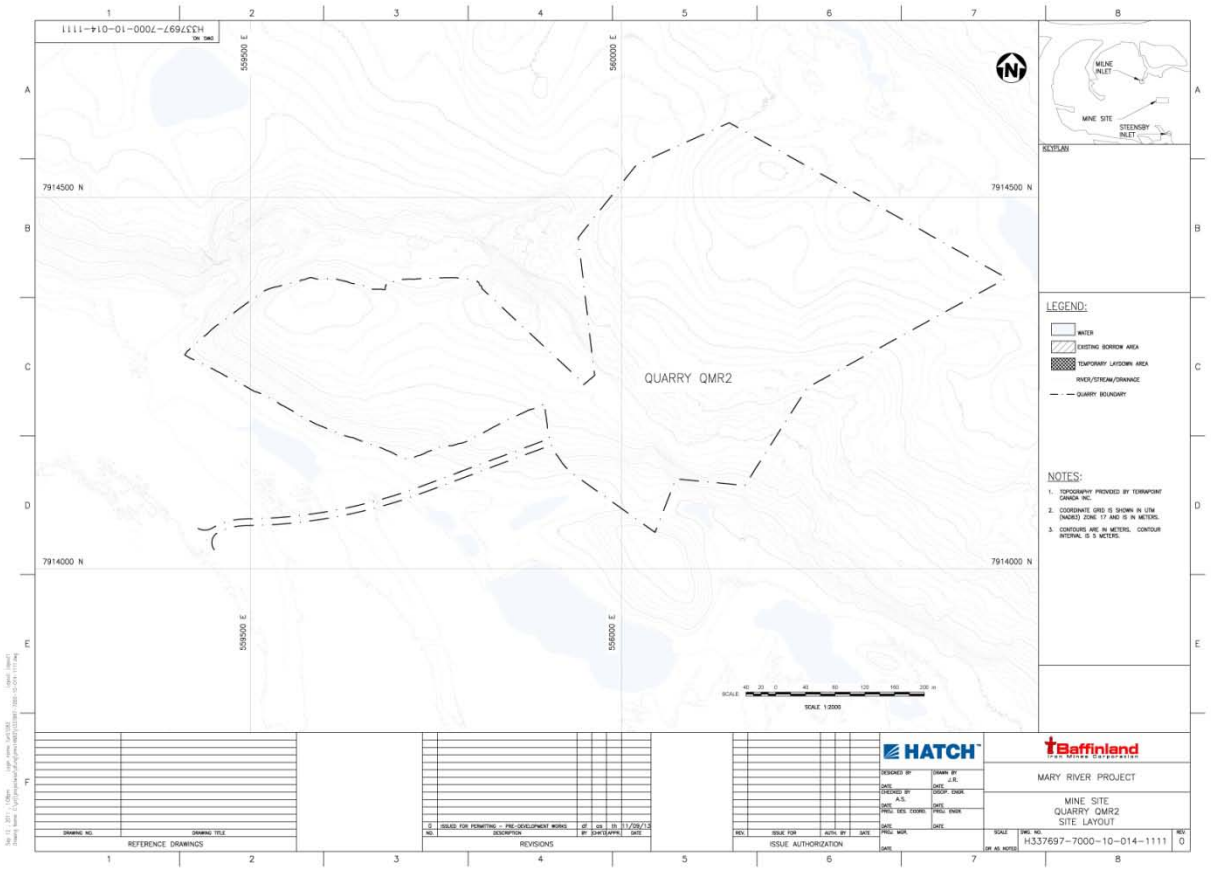

Figure 2: Mary River Mine Site - Quarry QMR2 Site Layout

1.3.1 Environmental Setting

In general, the proposed quarry area at the proposed Mary River quarry was found to be primarily either exposed bedrock hills or bedrock very close to surface (see Figure 2 and Figure 3). Lower depressions between the hills generally have a moderate layer of wet organics at surface and drainage is poor. These lower areas have a range of materials present from colluvial/alluvial type deposits to till with significant fines present. In areas where overburden was present, this generally comprised of a thin layer of organics, underlain by moist gravely sand with some silt.

At least 10 different surface water bodies exist within 200 m of the quarry boundary. All of these are relatively small (< 2 ha) with several being less than .1 ha in size. None of these lakes were found to contain fish species, due to the shallow nature of the basins. Camp Lake located 2 km to the west, and the north basin of Sheardown Lake, 500 m to the south east are known to contain arctic char. For this reason, the quarry extents were located to avoid any interaction with run-off channels or streams that access these water bodies.

Figure 3: Mary River Mine Site quarry showing bedrock outcroppings

Figure 4: Proposed Mary River Mine Site quarry looking west

Vegetation within the Mary River Project area is described in the Vegetation Baseline Study Report in Volume 6 of the DEIS (Appendix 6C). A total of 155 vascular plant species were recorded through the total Project area, a vegetation classification system was developed and a species list was compiled. No plant species considered to be "rare" in Canada were found to occur in the survey locations. Vegetation is extremely limited in the area of the proposed quarry, and exists in small patches where organic deposits occur around the base of the rock outcroppings, and in the valleys in between large boulders. Several species of songbirds and shorebirds migrate to this area annually to breed, and were predominately found in the various types of lowland habitats (river deltas, coastal plains, tundra, and near wetlands) that offer an abundant source of insects and vegetation for foraging and nesting habitat. This type of habitat is present within and near the proposed quarry site. Bird densities though, are considered to be relatively low.

Terrestrial wildlife on north Baffin Island is described in the terrestrial wildlife baseline report (Volume 6: Terrestrial, Appendix 6F). Terrestrial wildlife includes caribou, wolves, foxes, arctic hares, ermine, and small mammals. Occurrence of most wildlife species on north Baffin Island is relatively sparse, and this is expected to be especially true at the quarry site given the type of terrain.

Marine mammals present are not present in the area as the quarry site is displaced from shoreline habitat sufficiently to avoid being regarded as suitable habitat. However, polar bear are occasionally known to move through the area.

No settlements or known hunting camps or areas are located in proximity to the proposed quarry site. There are currently no roads, buildings or structures at the site.

2. Operation

The following outlines the operational activities for the proposed quarry at the Mary River Mine site.

2.1 Organization and Reporting

Figure 4 shows the 2012 Work Site Organization Chart. The entire Project will be under control of a Construction Director, with a Mary River and Milne Construction Manager directly reporting to him. An Area Coordinator Lead (AC) will report to the Construction Manager, and supervise AC#3, who will be directly responsible for quarry development and operations.

Common to all aspects of the Mary River and Milne construction will be a Project Administrator, a Safety Manager, and Engineering Site Lead, and an Environmental Coordinator.

All names and contact numbers for the above positions will be provided prior to the commencement of quarrying activities.

Common to all aspects of the Milne Inlet construction will be a Project Administrator, a Safety Manager, and Engineering Site Lead, and an Environmental Coordinator.

All names and contact numbers for the above positions will be provided prior to the commencement of quarrying activities.

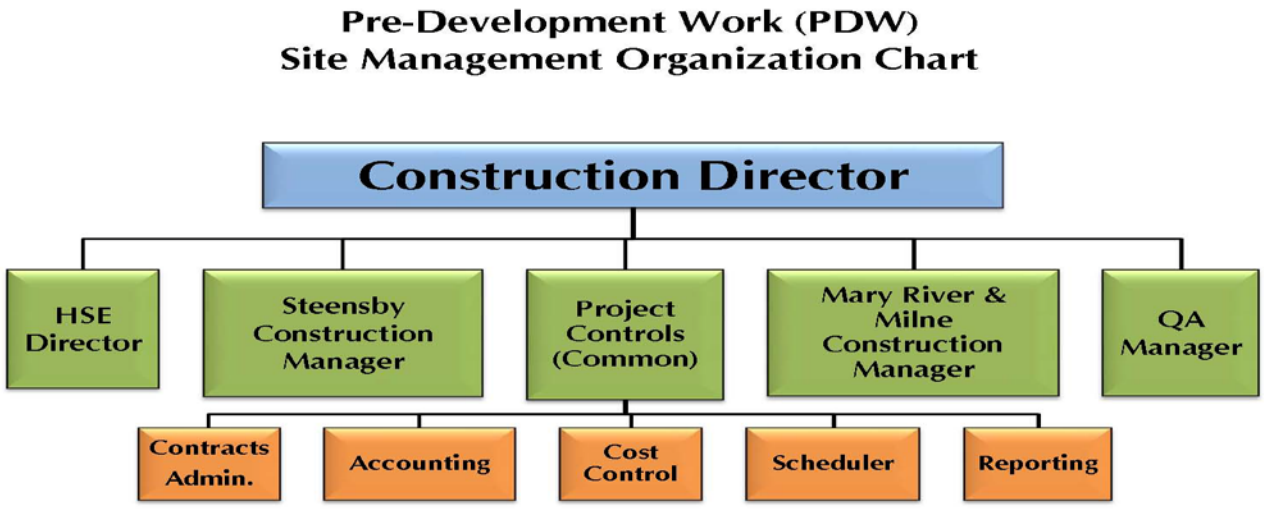

Figure 5: 2012 Work Site Management Organization Chart

2.2 Quarry Set Up and Operation

The quarry will be accessed by a temporary road from the main staging area road, and will be approximately 150 m in length and constructed of granular material. Equipment transported to the quarry site will include:

- Crushing, screening and cleaning plants (present at Mary River);
- Drilling Equipment;
- Rock hauling trucks;
- Scrapers;
- Excavators; and
- Blasting Gear.

A small (< 50 m2) portable field office trailer will be placed at the quarry site. Equipment will be serviced at maintenance facilities located at the nearby laydown area.

2.3 Quarrying Activities

The following describes the general activities:

2.3.1 Explosives Management and Blasting

Blasting operations will be carried out by Orica, an independent engineering firm specializing in blast monitoring and design. Orica will eventually be manufacturing and using an Ammonium Nitrate Emulsion (ANE). However, explosives for the development of the Mary River mine site quarry will initially consist of pre-packaged explosives with up to 100,000 kg stored within the Mary River Mine Site area. Pre-packaged explosives will gradually be replaced by AN mixtures once a temporary plant is erected and made operational. Transportation of explosives to and from the quarry site will occur from the temporary magazine storage area via road.

Drilling for the blasting will take place on a 5 foot grid pattern in an effort to minimize the rock size resulting from the blasting. Blasting management will be coordinated with the Area Coordinator responsible for quarries and borrow pits.

Blasting will take place on a day shift, seven days per week. An Explosives Management Plan for the Project, and an ANE Bulk Temporary Plant document have been developed by Orica and are available for review (refer to Attachment 8 of 2012 Work Plan).

2.3.2 Excavation and Crushing

The entire operation takes place in an area of permafrost, and groundwater is therefore not an issue. Drilling will be monitored to avoid creating run off and drainage issues. Washing of aggregate is not required, as the material will be used for site preparation only. Quarrying will work along the exposed rock faces and will be terraced to minimize run off from the site. Efforts will be made during blasting operations to avoid creating depressions which might collect run off or melt waters.

Drilling and extraction exercises may occur concurrently, depending on issues of safety and schedule.

Blast areas will be cleared by loader and/or scraper and put into rock trucks for transport to the crusher/screener facility. Loaders will feed rock to the crushing and screening operation.

Crushing and stockpiling areas will be located as near as practical to the southern extent of the quarry within easy access to the road location. Very little topsoil is present at the site, and would be considered as incidental material. As a result, no stockpiling area for topsoil will be required.

Crushing operations and screening operations will take place during the day shift, seven days per week. The operation will process all rock from the quarry, and may also process rock from other areas if required. Final material will be cleaned and stored by aggregate size in stockpiles for transport to the appropriate construction sites.

2.3.3 Site Security and Safety

Copies of all safety and management documents will be made available to on site personnel and mandatory training for operations at the Mary River Mine Site quarry will take place. The Area Coordinator will ensure that operations are consistent with other management plans, terms and conditions of the issued permits, and safety procedures for the Project.

Security signage will be posted at the entrance to the quarry. The remoteness of the quarry and the onsite presence of operations personnel will make perimeter fencing unnecessary. Audible warning systems will be employed for all blasting operations at posted intervals prior to any detonations.

Blasting and processing operations will be suspended if incursions into the quarry occur, or if observations of wildlife in the immediate quarry area are made. On site monitors for bear will provide warnings if approach by any animals is noted.

2.4 Site Management Measures

Best management practices for quarry operations will be followed for the Mary River Mine Site Quarry. The following management activities will be incorporated into the site operations:

2.4.1 Drainage Management

The potential to alter drainage patterns and affect local water quality exists. Prior to quarry operation, the hydro-geological regime around the quarry site will need to be defined, and appropriate direction of flows from site managed to maintain the natural flow patterns as much as possible. The quarry is currently designed to avoid surface water courses and drainage channels by a minimum of 30 meters.

Sources of contamination from the operation that could affect water quality include dust from blasting and refueling for equipment. Blast residues from explosives will be managed by ensuring that all material is ignited during the blasting process. Vehicle fueling will be conducted at a centralized fueling facility off site that has proper containment and spill response capability. Fueling for non-moveable onsite equipment, such as generators, will take place in a secured area with approved spill containment.

2.4.2 Dust Management

The primary sources of dust at the Mary River Mine Site Quarry are blasting, loading and crushing and screening of aggregates. Very little topsoil exists at the quarry site, and is not considered a primary source of dust. The management of dust will be accomplished by minimizing the creation of dust at source. Crushing activity will take place as far from surface water or dust sensitive areas as is practical at the site. If possible, protection from prevailing winds will be accomplished by situating the crushing operation to take advantage of the local topography for shelter. Transport of material will be subject to speed limit restrictions to help reduce dust.

Dust management activities will include monitoring surrounding snow for accumulations of quarry dust. If such deposits are noted, the snow layer will be removed prior to melting, and transported to the land farm.

2.4.3 Noise Management

Quarry activities will generate noise from equipment operation, blasting and crushing and screening operations. Noise receptors within the area are restricted to wildlife, as no dwellings or other land use that is sensitive to noise occur nearby.

During quarry operations, monitors will inform the quarry manager if significant wildlife activity, such as caribou movement or seal pull outs, is occurring. Depending on the concentrations and likely effect of the noise generating activity, the quarry manager may temporarily suspend operations.

2.5 Monitoring

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

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

3. Supporting Management Plans

This plan should be viewed in concert with the following additional plans prepared for the pre-development works:

- Emergency and Spill Contingency Plan – Attachment 8;
- Surface Water and Aquatic Ecosystems Management Plan – Attachment 8;
- Addendum to Wastewater Management Plan – Attachment 8;
- Terrestrial Environment Management – Attachment 8;
- Explosives Management Plan – Attachment 8; and
- Abandonment and Reclamation Plan – Attachment 6.

4. Closure Activities

The abandonment of the 2012 Work and site reclamation for the quarries and borrow pits will be undertaken if the Project is not developed or if approvals are not granted. If the Project's EIS application is approved the Mary River Mine Site quarry will be integrated into the overall Project Close Out plan. However, separate closure plans for the Mary River Mine Site quarry and borrow pit operations are required. Abandonment of the quarry will involve removing 2012 Work materials, equipment and infrastructure and reclaiming the site to self sustaining productive ecosystem as near its original condition as is achievable and practical.

4.1 Abandonment of Active Quarry Face

The active quarry face will be terraced during operation to closely manage issues related to drainage and will not be altered for closure. The quarry development will preclude the creation of pits and depressions as much as possible.

4.2 Waste Disposal

All site waste will be collected and placed in appropriate containers for removal. Pre and post waste removal inspections will be made to ensure the thoroughness of the program. Waste will include metallic waste, construction material waste and domestic waste.

At the current time, no washroom facilities for personnel are expected at the quarry site. Any requirement for such facilities will be met by easily removable portable toilets. These will be operated in a manner consistent with regulations, and disposal will be in accordance to the waste management plans.

4.3 Stockpile Removal

Quarrying activities will be closely managed to avoid the accumulation of unnecessary stockpiles of aggregate. Any stockpiles that do remain will be dealt with as follows:

- Large rock will be spread out on the landscape;
- Medium sized rock will be used to re-contour affected areas to re-establish a more natural appearance to the area; and
- Small crushed rock will be used to assist in drainage restoration, and spread on the landscape to re-establish more natural contours.

4.4 Road Closure

The Mary River Mine Site quarry road is a relatively short (< 300 m) aggregate structure. The entire road bed will be removed, and the material utilized in re-establishing natural contours throughout the area.

4.5 Soil Remediation for Contaminated Soils

A pre-closure inspection of the entire quarry site will be made. Any contaminated soils, snow or ice packs, or overburden will be flagged. The extent of the contamination will be determined, and the material removed. Hydrocarbon contaminated soils or overburden will be transported to the land farm established on site. Other contamination, such as heavy metals or toxins, will require containerization for shipping off site to an appropriate facility (refer to Abandonment and Closure Plan, Appendix B.12).