Baffinland Iron Mines Corporation

KM104 BORROW SOURCE MANAGEMENT PLAN

BAF-PH1-830-P16-0035

Rev 1

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1 INTRODUCTION

The following document is a borrow source management plan for km104. For further detail regarding borrow source best management practices for the Mary River Project, see Appendix D (Borrow Source Approach) of the Borrow Pit and Quarry Management Plan (BAF-PH1-830-P16-0004).

During execution of the 2014 Work Plan borrow material will be required from sources along the Tote Road, sources at the Mary River Mine Site and at the Milne Port site. Borrow material is an essential element for numerous construction activities including: grading, laydown areas, backfill, foundations for the aerodrome, fuel storage, camp expansion, local roads and administration and maintenance facilities, and heavy equipment storage. The purpose of this management plan is to outline the plan for operating the borrow source at km104.

1.1 REGULATORY REQUIREMENTS

As with all quarries and borrow sources in operation and/or reclamation phases on the Mary River Project site, KM104 Borrow Source operation and reclamation shall be conducted as in compliance with the Borrow Pit and Quarry Management Plan (BAF-PH1-830-P16-0004) and all federal, territorial and municipal statutes, regulations, bylaws, codes or policies regulatory requirements including Mine Health & Safety Act (Nunavut).

1.2 CHANGES TO MANAGEMENT PLAN

For KM104 Borrow Source, any material changes to the activities and requirements stipulated in this management plan shall be approved in writing by the Materials Handling Department in concert with the Baffinland Environmental Department. Express written consent of the Qikiqtani Inuit Association for material changes of this Plan is required by under Commercial Lease Q13C301.

2 BORROW SOURCE LOCATION AND QUANTITY

All quarrying activity will be exclusively limited to lands identified in this Borrow Source Management Plan and as indicated in Drawing H349000-4138-10-015-0008, attached in Appendix A. Operation will continue as necessary at existing borrow source areas adjacent to the Tote Road at Km 104 at the transition from where the Tote Road becomes the Haul Road to Pit 1. Please refer to Drawing H349000-4138-10-015-0008, attached in Appendix A for more information on the location of the borrow sites at km104. Table 2-1 summarises the quantities expected to be extracted from this borrow site. 1

TABLE 2-1: BORROW PIT KM104 SPECIFICATIONS

Requirement	Description
NTS Map Sheet (1:50,000)	• 37 G5 Edition 1 ASE Series A 713
Quarry Vertices Coordinates (UTM)	Km104 West Deposit • 7,913,039 N 562,135 E (Centre point) • 7,913,139 N 561,851 E (NW Corner) • 7,913,090 N 562,282 E (N Corner) • 7,912,902 N 562,363 E (NE Corner) Km104 East Deposit • 7,912,808 N 562,719 E (Centre Point) • 7,912,814 N 562,511 E (W Extent) • 7,912,828 N 562,782 E (N Extent) • 7,912,739 N 562,873 E (E Extent)
Total Area of Borrow Site	• 4.81 ha for the West and 0.84 ha for East = 5.65 ha as shown in Appendix A
Volume with Contingency	• 50,000 m^3
Area of Existing Clearing	• 3.57 ha little clearing is required for larger area as site is primarily exposed gravels
Area of Proposed Quarrying	• Appendix A shows the borrow pit extents
Topsoil/Overburden Storage Area	• None is required as site is primarily exposed gravels. If overburden topsoil is removed, it will be stockpiled on site and used for future reclamation
Access Roads/Trails	• The borrow pit will be accessed directly from the Tote Road
Camp Locations	• No camp will be built specifically for the borrow pit operation. Personnel will be housed at the existing Mary River camp

2.1 BORROW SOURCE KM104

Borrow source Km104 is located at approximately kilometre 104 along the Tote Road at the transition to the Tote Road becoming the Haul road up to Pit 1. The borrow source consists of glacial outwash gravels and sands that formed as a result of glacial action and water deposition. The sands and gravels originate from the erosion, transport, and deposition of materials that originate from the varied bedrock underlying the adjacent area and region. This has resulted in a relatively high content of Paleozoic carbonates consisting of dolestone and limestone. A large volume of this borrow type material has been successfully used over the past five years to support Tote Road and Haul Road construction and maintenance. There has been no evidence of the development of ARD or metal leaching processes at or downstream of the existing road embankment. In summary, it is unlikely that the materials from this borrow source will generate ARD and leach metals for the following reasons:

- The origin of the materials are unconsolidated waterborne sediments and hence the unlikely presence of high concentrations of metals.
- There is an absence of sulphide minerals based on visual observations of the material.
- There is a lack of ARD or metal leaching evidence along the Tote Road embankment which contains a large volume of this material.
- There is a high relative abundance of carbonate rock materials which offer significant acid buffering capacity for the material as a whole.

FIGURE 2-1: BORROW SITE KM104 WEST ALONG HAUL ROAD SHOWING GRAVELS

FIGURE 2-2: BORROW SITE KM104 EAST ALONG HAUL ROAD SHOWING GRAVELS

Development of the KM104 Borrow Site is expected to progress as detailed in the following steps:

2.1.1 BORROW SOURCE DEVELOPMENT

The borrow source has been previously accessed for use in building the Haul Road as well as the Tote Road. Little site development is required however storm water needs to be managed to ensure that rainfall does not collect at the borrow source and lead to any potential permafrost degradation. As required, storm water drainage will be managed with perimeter ditching and/or berms to divert rainfall or snow melt to natural drainage channels. Rip-Rap rock check dams will be placed at strategic locations along the drainage channel to minimize erosion by reducing flow velocities and to promote settlement of sediments prior to discharge.

Prior to accessing the sites for material, a survey will be done to establish a baseline of the topography. 1

2.1.2 ACCESS ROAD

This borrow site is adjacent to the existing Mine Pit Road; therefore access to the area where material is extracted will be via a simple graded surface at existing ground elevation. This access road is used to transport the borrow materials from the material source to the crusher pad for processing and loading the finished product. A dedicated embankment is not necessary since the existing soils will support the expected truck and equipment loads. There is a non fish bearing stream north of the borrow site. The future Haul Road alignment transects the footprint of the borrow site so the drainage plan reflects the final footprint once the Haul Road is built.

2.1.3 SUMMER EXTRACTION OPERATIONS AT BORROW SITE

Summer extraction of borrow can be achieved by simple excavation of thawed gravels at the surface, dozing the thawed materials into a stockpile, loading, and hauling to the crusher or to the construction site for placement. The material is then hauled to where it is needed or taken to the central crushing and screening operations near Quarry QMR2 to grade the material.

2.1.4 WINTER EXTRACTION OPERATIONS AT BORROW SITE

Winter extraction of borrow material will be similar to that of summer extraction using an excavator, unless the material is too frozen. In this case, with the use of a track drill, a bench is drilled and blasted at some designated elevation to begin bench development. Bench development can proceed from a higher elevation to a lower elevation or vice versa, depending on the topography of the site. Blasted borrow material is ready for loading into haul trucks and hauled to the crusher pad as crusher feed material to produce finished products or hauled to construction sites if crushing is not required.

2.1.5 BENCH DRILLING

As each drill round is blasted out, the drill either stays at this elevation to expand the bench in a longitudinal direction along the face, or the drill climbs to a higher or lower elevation to drill and blast subsequent benches. These benches are expanded in length as required for subsequent blasting of borrow at that elevation. Benches are created for safety and for efficient drill/blast operations.

2.1.6 SUBSEQUENT BENCH DEVELOPMENT

Each bench proceeds toward the main body of borrow rock at that elevation. Lower benches follow behind upper benches and drilled and blasted to move toward the main body of rock. Ramps may be constructed to the upper benches for truck loading near the blasted rock. Whenever practical benching will be minimized during borrow operations, instead utilizing the pushback of hills. When benches are deemed necessary to operate the borrow source safely and effectively, the will be properly re-graded upon closure of the borrow source to ensure natural drainage and avoid the pooling of water.

2.1.7 DRILLING FROZEN GRAVELS

Drilling frozen gravels is completed with the use of one or two drill rigs using small diameter boreholes less than 125 mm. The boreholes are laid out by a surveyor to the engineered spacing and burden for each particular rock type and geologic conditions. The drill is removed from the area for loading explosives and blasting. The drill can proceed along the bench to continue drilling or proceed to a new bench.

2.1.8 BLASTING OPERATIONS

Blasting frozen gravels is completed by installing high explosive detonating boosters at the bottom of each hole with initiation wires extending to the surface for connection to the blasting circuit, followed by dropping in pre-packaged sticks of explosives and pouring from pre-packaged emulsion bags. Detonation and initiation is carried out with the use of delays to time the detonators in a fast millisecond sequence of smaller blasts for efficient loosening of the frozen gravels. Blasting lags behind the drill as more drilling is completed. As each new drill round is completed, the drill moves on and the drilled round is loaded with explosives or emulsion and blasted.

2.1.9 HAULING BORROW GRAVELS

The blasted material is loaded onto trucks for delivery to the crusher, temporary stockpiles or to construction sites.

2.1.10 CRUSHING OPERATIONS

Borrow material is fed to the crusher and/or screening equipment to size and produce the desired rock product, stored in stockpiles and loaded into trucks for delivery to construction sites.

3 ENVIRONMENTAL AND SOCIAL REQUIREMENTS

All environmental monitoring and inspections conducted at Borrow Source KM104 shall abide by the EHS Framework Standard (BAF-PH1-830-STD-0001), the Borrow Pit and Quarry Management Plan (BAF-PH1-830-P16-0004) and all other applicable Project management plans including but not limited to the Environmental Terms and Conditions attached as Schedule "F" to the Commercial Lease Q13C301.

3.1 CULTURAL HERITAGE & ARCHAEOLOGICAL RESOURCES AT BORROW SOURCE KM104

All project areas have been assessed to some degree and although a number of archaeological or cultural heritage sites have been identified elsewhere on the Project site, none were identified in the area required for Borrow Source KM104. The potential exists however to encounter undiscovered cultural heritage or archaeological resources when conducting construction activities such as excavating and site clearing. In the unlikely event cultural heritage and/or, archaeological resources are found or suspected to be found (i.e. Chance Finds) at Borrow Source KM104, all work will stop and the Environmental Protection Measures outlined in the Environmental Protection Plan (BAF-PH1-830-P16-0008) and Cultural and Heritage Resource Protection Plan (BAF-PH1-830-P16-0006) will be implemented.

It should be noted that Cultural Heritage sites include “Carving stone” resources. "Carving stone”, means uthugighak and sananguagaq in Inuktitut, refers to serpentines, argillite and soapstone as defined pursuant to Article 1.1.1 of the Nunavut Land Claims Agreement. In the event carving stones resources are found, Article 19 of the IIBA with respect to the rights of Inuit to Carving Stone shall be followed.

4 BORROW SOURCE RECLAMATION

As per the Interim Abandonment and Reclamation Plan (BAF-PH1-830-P16-0012) and the approved Preliminary Mine Closure and Reclamation Plan (H337697-0000-07-126-0014) for the Mary River Project, the primary goals relevant to the reclamation and rehabilitation of KM104 Borrow Source include:

- Provide for the long term physical and chemical stability of the area so as to protect the public health and safety and ecosystem integrity.
- Promote and enhance natural re-vegetation and recovery of disturbed areas that is compatible with the surrounding natural environment and allow for the future use by people and wildlife.
- Implement reclamation in a progressive, on-going manner during the life of the Project and restore sites as soon as an area is no longer required to limit the need for long term maintenance and monitoring.

To meet these goals both the Interim Abandonment and Reclamation Plan (BAF-PH1-830-P16-0012) and the approved Preliminary Mine Closure and Reclamation Plan (H337697-0000-07-126-0014) for the Project specifically state[1] the following closure objectives to measure the effectiveness of the progressive reclamation for areas that impact watercourse(s) and drainage patterns as in the case of KM104 Borrow Source:

- Dismantle and remove/dispose of as much of the system as possible and restore natural drainage patterns.
- Stabilize and protect from erosion and failure for the long term.
- Achieve approved water quality limits.

4.1 REQUIREMENTS OF THE LANDOWNER

KM104 Borrow Source is located on Inuit Owned Lands that are managed by the Inuit Association in the region, the QIA. As such, KM104 Borrow Source is subject to the guiding principles for reclamation of Inuit Owned Land developed by the QIA. The QIA reclamation principles applicable to KM104 Borrow Source, include:

- Reclamation should be planned and executed so as to achieve a site which is physically, chemically, and biologically stable upon closure.
- Reclamation should result in a site which is aesthetically and environmentally compatible with the surrounding undisturbed landscape.

[1] See: Section 11, Interim Abandonment and Reclamation Plan (BAF-PH1-830-P16-0012) , Section 11, Preliminary Mine Closure and Reclamation Plan (H337697-0000-07-126-0014)

- Site-specific reclamation requirements should be consistent with the locally valued ecosystem components and regional planning objectives, including land use plans.
- Land use operations should be planned and conducted in a manner that minimizes reclamation requirements at closure.
- Land users may be required to undertake in post-activity monitoring to confirm reclamation objectives have been achieved.

4.2 SUCCESS CRITERIA OF KM104 BORROW SOURCE PROGRESSIVE RECLAMATION & REHABILITATION

Baffinland proposes that the KM104 Borrow Source will be considered reclaimed and rehabilitated when the site is:

- Physically stable and showing no further signs of ongoing permafrost degradation.
- Free draining through the use of swales and site grading, to prevent pooling/ponding of surface water.
- Consistently achieving water quality results within water quality limits as per Table 1 (Part D item 16 of the NWB Type A Water Licence, 2AM-MRY1325).

Appendix A -
Kilometre 104 Borrow Development Area Drainage Plan – H349000-4138-10-015-0008

DWG. NO. H349000-4138-10-015-0008

E 561 181 E 562 000 E 562 200 E 562 400 E 562 600 E 562 800

N 7 913 400

N 7 913 200

N 7 913 000

N 7 912 800

MQ-C-H
N 7 913 173
E 561 870

N 7 913 139
E 561 851

CENTRE OF QUARRY
N 7 913 039
E 562 135

N 7 913 090
E 562 282

REALIGNED HAUL ROAD

MP-C-H
N 7 912 979
E 561 847

N 7 912 902
E 562 363

MQ-C-J
N 7 912 858
E 562 524

CENTRE OF QUARRY
N 7 912 808
E 562 719

N 7 912 828
E 562 782

MQ-C-K
N 7 912 825
E 562 504

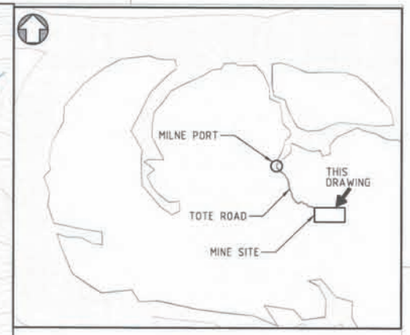
N 7 912 814
E 562 511

EXISTING HAUL ROAD

NEW HAUL ROAD

N 7 912 739
E 562 873

242 204 216 218 234 222 244



KEY PLAN

LEGEND

- EXISTING WATERBODY
- PROPOSED FOOTPRINT OF BORROW SOURCE AREA
- 242 EXISTING CONTOUR
- EXISTING STREAM
- OVERLAND FLOW PATH
- EXISTING DRAINAGE TO BE DIVERTED/ABANDONED
- SURFACE DRAINAGE DIVERSION
- INTERNAL SURFACE DRAINAGE
- RIDGE LINE (HIGH POINT)
- PROPOSED CULVERT
- WATER QUALITY MONITORING LOCATION
- HAUL ROAD NORTH SIDE DITCH

NOTES:

1. TOPOGRAPHY PROVIDED BY TERRAPOINT CANADA INC.
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. CONTOURS ARE IN METRES. CONTOUR INTERVAL IS 2.0 METRES.

FOR PERMITTING

0 20 40 60 80 100
SCALE IN METRES

DRAWING NO.	DRAWING TITLE
H349000-4221-10-012-0002	MINE HAUL ROAD-STA. 0+600 TO 1+200-PLAN & PROFILE
H349000-4221-10-012-0001	MINE HAUL ROAD-STA. 0+000 TO 0+600-PLAN & PROFILE

REFERENCE DRAWINGS

PERMIT TO PRACTICE
HATCH LTD.
Signature
Date 19 MAR 14
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

NO.	DESCRIPTION	BY	CHK'D	APP'D	DATE

REVISIONS

REGISTERED PROFESSIONAL ENGINEER M. M. S. HASSAN LICENSED NTI/NU

REV.	ISSUE FOR	AUTH. BY	DATE
0	PERMITTING	SH	2014-03-19

ISSUE AUTHORIZATION

HATCH

DESIGNED BY: D. SINGH DATE 2014-03-19	DRAWN BY: D. SINGH DATE 2014-03-19	
CHECKED BY: A. MOKHTARKHANI DATE 2014-03-19	DISCIP. ENGR: S. HASSAN DATE 2014-03-19	
PROJ. COORD. DATE 2014-03-19	PROJ. MNGR. DATE 2014-03-19	
PROJ. MGR. S. PERRY DATE 2014-03-19		

Baffinland

MARY RIVER PROJECT

MINE SITE
KILOMETER 104 BORROW DEVELOPMENT AREA
DRAINAGE PLAN

SCALE	DWG. NO.	REV.
1:2000 OR AS NOTED	H349000-4138-10-015-0008	0

ORIGINAL SHEET SIZE: ISO A1 (841 x 594)

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