Baffinland Iron Mines Corporation

Borrow Source Management Plan – Kilometre 97
BAF-PH1-830-P16-0032
Rev 0

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1 INTRODUCTION

The following document is a borrow source management plan for km 97. For further detail regarding borrow sources 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 the execution of the 2015 Work Plan borrow material will be required from sources at the Mary River Mine Site and at the Milne Port site. Borrow material is an essential element for numerous construction activities including: concrete production, grading, laydown areas, backfill, foundations for the aerodrome, fuel storage, camp expansion, local roads, administration and maintenance facilities, and heavy equipment storage; as well as operational activities such as sanding the road during winter. The purpose of this management plan is to outline the plan for operating the borrow source at Km 97.

1.1 REGULATORY REQUIREMENTS

As with all quarries and borrow sources in operation and/or reclamation phases on the Mary River Project site, Km 97 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).

The financial security for rehabilitation of the Borrow Source, as per the NWB Type A Water Licence (2AM-MRY1325) and the Commercial Lease Q13C301 with the Qikiqtani Inuit Association will be estimated and posted during the Annual Work Plan and closure cost adjustment process.

1.2 CHANGES TO MANAGEMENT PLAN

For Km 97 Borrow Source, any material changes to the activities and requirements stipulated in this management plan shall be approved in writing by the Mine Operations or Material Handling Departments in concert with the Baffinland Environmental Department.

2 BORROW SOURCE LOCATION AND QUANTITY

All quarrying activity will be limited to lands identified in this Borrow Source Management Plan and as indicated in Drawing H349000-2138-10-015-0002, attached in Appendix A. Operation will continue as necessary at existing borrow source areas adjacent to the Tote Road at Km 97. Please refer to Drawing H349000-4138-10-015-0009, attached in Appendix A for more information on the location of the borrow sites at km 97. Table 2-1 summarises the quantities expected to be extracted from this borrow source.

TABLE 2-1: BORROW SOURCE KM97 SPECIFICATIONS

Requirement	Description
NTS Map Sheet (1:50,000)	• 37 G5 Edition 1 ASE Series A 713
Quarry Vertices Coordinates (UTM)	Area 1 Deposit • 7,915,169 N 556, 847 E (Centre point) • 7,915,250 N 556,723 E (NW Corner) • 7,915,234 N 556,860 E (N Corner) • 7,915,221 N 556,971 E (NE Corner) • 7,915,165 N 557,005 E (E Corner) • 7,915,154 N 556,719 E (SW Corner) • 7,915,173 N 556,758 E (W2 Corner) • 7,915,207 N 556,754 E (W1 Corner) Area 2 Deposit • 7,915,083 N 556,672E (Centre point) • 7,915,105 N 556,587 E (NW Corner) • 7,915,118 N 556,674 E (N Corner) • 7,915,097 N 556,771 E (NE Corner) • 7,915,045 N 556,656 E (S Corner) • 7,915,053 N 556,586 E (SW Corner) Area 3 Deposit

	• 7,915,152 N 555,972 E (Centre point) • 7,915,350 N 555,854 E (NW Corner) • 7,915,365 N 555,916 E (N Corner) • 7,915,349 N 555,979 E (NE Corner) • 7,915,184 N 556,019 E (E Corner) • 7,915,010 N 556,105 E (SE Corner) • 7,914,952 N 555,979 E (SW Corner) • 7,915,112 N 555,895 E (W Corner) Area 5 Deposit • 7,914,874 N 555, 883E (Centre point) • 7,914,838 N 555,833 E (NW Corner) • 7,914,894 N 555,867 E (N Corner) • 7,914,942 N 555,921 E (NE Corner) • 7,914,922 N 555,936 E (SE Corner) Km 97 Rehabilitation Area Deposit • 7,914,577 N 556,020 E (Centre point) • 7,914,783 N 555,874 E (Point 1) • 7,914,959 N 556,144 E (Point 2) • 7,914,904 N 556,168 E (Point 3) • 7,914,898 N 555,977 E (Point 4) • 7,914,746 N 556,078 E (Point 5) • 7,914,314 N 556,134 E (Point 6) • 7,914,217 N 555,881 E (Point 7) • 7,914,708 N 555,989 E (Point 8)
Total Area of Borrow Site	• Area 1 = 2.71 ha

	• Area 2 = 0.95 ha • Area 3 = 5.96 ha • Area 5 = 0.57 ha • Km 97 Rehabilitation Area = 10.62 ha as shown in Appendix A
Volume with Contingency *Note the volume to be extracted the following year will be confirmed in the Work Plan for that year	• 50,000 m^3
Area of Existing Clearing	• 15.7 ha is estimated as already cleared from historical access to these borrows
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 sources will be accessed directly from the Tote Road
Camp Locations	• No camp will be built specifically for the borrow source operation. Personnel will be housed at the existing Mary River camp

2.1 BORROW SOURCE KM 97

Borrow sources at Km 97 are located at approximately kilometre 97 to 98 along the Tote Road. Km97 Borrow Source is situated approximately 5km from the Mary River Mine Site, along the Tote Road from Milne Port to the Mary River Mine Site. This has been a borrow site for the construction and maintenance of the Tote Road for the previous eight (8) years. The borrow source consists of glacial outwash gravels and sands that formed as a result of glacial action and water deposition and from windblown sediments. The sand deposits at km 97 are a combination of small amounts of windblown sediments mixed in with mostly alluvial sediments. In general, there is not a high concentration of carbonate materials in the km-97 borrow sites.

A large volume of this borrow type material has been successfully used to support Tote Road and Mine Construction activities 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 and windblown 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.

FIGURE 2-1: BORROW SITE KM97 ALONG TOTE ROAD SHOWING GRAVELS (0557)

FIGURE 2-2: BORROW SITE KM97 (0558)

FIGURE 2-3: BORROW SITE KM97 (0559)

FIGURE 2-4: BORROW SITE KM97 (0560)

FIGURE 2-6: BORROW SITE KM97 (0561)

FIGURE 2-5: BORROW SITE KM97 (0562)

Development of the KM 97 Borrow Site is expected to progress as detailed in the following steps:

2.1.1 BORROW SOURCE DEVELOPMENT

The borrow sources have been accessed for use along the Tote Road and at the Mine Site. 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 potential permafrost degradation. As required, storm water drainage will be managed with finish grading and landscaping to divert surface water flow to natural flow patterns, 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 channels to minimize erosion by reducing flow velocities and to promote settlement of sediments prior to discharge downstream.

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

2.1.2 ACCESS ROAD

The borrow sources at Km 97 include: Area 1, Area 2, Area 3, Area 5 and KM 97 Rehabilitation Area. These sites can be accessed directly via the Milne Inlet Tote Road. If required a simple graded surface will be established at existing elevation to allow access to the area where material will be extracted. Borrow materials from the material source will be transported to the crusher pad for processing and loading the finished product.

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

Although not expected, 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 is repositioned 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 are 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 benches 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 drill hole with initiation wires extending to the surface for connection to the blasting circuit. Once detonating boosters are loaded, pre-packaged sticks of explosives and/or emulsion is loaded into the hole. 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. Blasting will only occur if the gravels are frozen.

2.1.9 HAULING BORROW GRAVELS

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

As per the Commercial Lease Q13C301 the record of quantities of material removed from the borrow site will be reported on a regular basis in the same report as the other active quarry and borrow sources.

2.1.10 CRUSHING OPERATIONS

Borrow material is fed to the crusher and/or screening equipment to size and produce the desired finished 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 KM 97 shall abide by 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 KM 97

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 KM 97. There is a very low potential 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 KM 97, 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 Mine Closure 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 the borrow sources at KM 97 includes:

- 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 Mine Closure 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 KM97 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 criteria for surface drainage from the area.

The above goals and objectives for rehabilitation of the borrow sources located at KM 97 will apply. However additional reclamation and rehabilitation activities will be required at Km 97 Rehabilitation Area. The primary objective in planning the reclamation and rehabilitation of Km97 Borrow Source is to establish pit drainage without initiating new degradation of the permafrost and to stabilize ice-rich permafrost soils that if thawed would result in ongoing and unstable depressions of pooled water. For additional details on factors that need to be addressed to prevent degradation of the landscape and to establish physical stability of the area for the long term refer to Progressive Reclamation of Borrow Source at Km 97 (H349000-4138-10-220-0001) in Appendix B of this document. The intention is to only rehabilitate this particular area and not extract further materials from there, rather focus on areas: Area 1, Area 2, Area 3 and Area 5 for borrow materials.

[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)

4.1 REQUIREMENTS OF THE LANDOWNER

Km 97 Borrow Source is located on Inuit Owned Lands that are managed by the Inuit Association in the region, the QIA. As such, Km 97 Borrow Source is subject to the guiding principles for reclamation of Inuit Owned Land developed by the QIA. The QIA reclamation principles applicable to Km 97 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.
- 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 KM 97 BORROW SOURCE PROGRESSIVE RECLAMATION & REHABILITATION

Baffinland proposes that the Km 97 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).

The financial security held by the QIA for the borrow sources will be released once the criteria above have been satisfied and the environmental inspection is complete (as per the Abandonment and Reclamation Policy for Inuit Owned Lands – Qikiqtani Inuit Association).

Appendix A –
Kilometer 97 Borrow Source Area Overall Drainage Plan – H349000-4138-10-015-0009

DWG. NO. H349000-4138-10-015-0009

N 7 915 200
N 7 915 000
N 7 914 800
N 7 914 600
N 7 914 400

E 555 800
E 556 000
E 556 200
E 556 400
E 556 600
E 556 800
E 557 000

CENTRE OF BORROW AREA 3
N 7 915 152
E 555 972

CENTRE OF BORROW AREA 5
N 7 914 874
E 555 883

MBP-C-A8
N 7 914 875
E 555 788

MBP-C-A7
N 7 914 798
E 555 845

MBP-C-A1
N 7 914 677
E 555 969

BRIDGE AT KM 97

FILL AND SLOPE TO SWALE SEE NOTE 6

MBP-C-A9
N 7 915 088
E 556 170

MBP-C-A10
N 7 915 187
E 556 462

CENTRE OF BORROW AREA 2
N 7 915 083
E 556 672

CENTRE OF BORROW AREA 1
N 7 915 169
E 556 847

TOTE ROAD

MBP-C-A3
N 7 915 027
E 556 243

MBP-C-A11
N 7 915 073
E 557 047

MBP-C-A6
N 7 914 925
E 556 667

FILL AND SLOPE TO SWALE SEE NOTE 6

MBP-C-A2
N 7 914 765
E 556 281

EXISTING MATERIAL STOCKPILE TO BE USED TO FILL DEPRESSED AREAS

MBP-C-A4
N 7 914 583
E 556 216

FILL AND SLOPE TO SWALE SEE NOTE 6

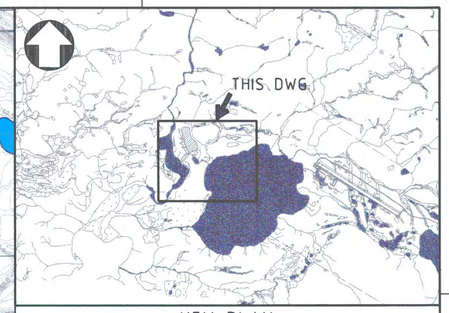
Km 97 BORROW SOURCE

MBP-C-A5
N7 914 400
E 556 224

FOR DETAILS ON THE RECLAMATION AND REHABILITATION OF THIS SITE SEE H349000-4138-10-015-0007

SURVEY LIMIT MARCH 2014

0 25 50 75 100 125
SCALE IN METRES



KEY PLAN

LEGEND

- FILL AND GRADE DEPRESSIONS
- EXISTING WATERBODY
- PROPOSED FOOTPRINT OF BORROW AREA #1,2,3 and #5
- EXISTING GROUND CONTOURS
- SURVEY LIMIT MARCH 2014
- BOUNDARY
- EXISTING MATERIAL STOCKPILE
- EXISTING BOUNDARIES FOR BORROW AREAS AND ROCK QUARRY LOCATIONS
- CENTERLINE OF SWALE
- EXISTING STREAM
- FLOW ALONG TOTE ROAD
- OVERLAND FLOW PATH
- EXISTING DRAINAGE TO BE DIVERTED/ABANDONED
- SURFACE DRAINAGE DIVERSION
- INTERNAL SURFACE DRAINAGE
- RIDGE LINE (HIGH POINT)
- PROPOSED CULVERT
- EXISTING CULVERT (LOCATION APPROXIMATE)
- PROPOSED ROAD
- EXISTING ROAD
- PROPOSED WATER QUALITY MONITORING LOCATION

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 0.3 METRES.
4. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES UNLESS NOTED OTHERWISE.
5. ALL LOW AREAS OR DEPRESSIONS SHALL BE FILLED AND GRADED TO DRAIN AREAS TO DISCHARGE LOCATIONS. REFER TO H349000-4138-10-015-0007 FOR MORE INFORMATION.
6. FINAL FILL EXTENTS, ELEVATIONS AND SURFACE SLOPES SHALL BE ADJUSTED IN THE FIELD.

FOR PERMITTING

DRAWING NO.	DRAWING TITLE
H349000-4138-10-015-0007	MINE SITE KILOMETER 97 BORROW SOURCE AREA DRAINAGE AND REHABILITATION PLAN

REFERENCE DRAWINGS

PERMIT TO PRACTICE HATCH LTD.
Signature
Date 07APR2014
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 LICENSEE 07APR14 NT/NU

REV.	ISSUE FOR	AUTH. BY	DATE
A	PERMITTING	SH GJ	2014-04-07

ISSUE AUTHORIZATION

HATCH™

DESIGNED BY G. JUBINVILLE DATE 2014-04-07	DRAWN BY G. JUBINVILLE DATE 2014-04-07
CHECKED BY A. MOHEEKHANI DATE 2014-04-07	DISCIP. ENGR. S. HASSAN DATE 2014-04-07
PROJ. DES. MGR. T. THERRELL DATE 2014-04-07	PROJ. ENGR. J. CLELAND DATE 2014-04-07
PROJ. MGR. S. PERRY DATE 2014-04-07	

Baffinland

MARY RIVER PROJECT

MINE SITE
KILOMETER 97 BORROW SOURCE AREA
OVERALL DRAINAGE PLAN

SCALE	DWG. NO.	REV.
1:2500 OR AS NOTED	H349000-4138-10-015-0009	A

ORIGINAL SHEET SIZE: ISO A1 (841 x 594)

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Appendix B –
Progressive Reclamation of Borrow Source at Km97 – H349000-4138-10-220-0001

Project Memo

H349000

26 March 2014

TO: Jim Millard

FROM: Joel Gregorios

cc: Erik Madsen
Stephen Ranger
Michael Anderson
Shawn Tucker

Sabbir Hassan
Tessa Mackay
Steve Perry

Baffinland Iron Mines Corporation
Mary River Project

Progressive Reclamation & Rehabilitation of Borrow Source at Km97

1. Introduction and Purpose

This technical memorandum is to address the reclamation and rehabilitation for the borrow source at km 97 of the Milne Inlet Tote Road (Km97 Borrow Source). Km97 Borrow Source is situated approximately 5km from the Mary River Mine Site, along the Tote Road from Milne Port to the Mary River Mine Site. This has been a borrow site for the construction and maintenance of the Tote Road for the previous eight (8) years.

Baffinland Iron Mines Corporation (Baffinland) is committed to progressive reclamation of the Mary River Project (the Project) site. Select borrow areas along the Tote Road have been identified as a potential environmental concern for both Baffinland and the Qikiqtani Inuit Association (QIA)[1]. This technical memorandum serves to address Baffinland's progressive reclamation objectives and strategy for Km97 Borrow Source considering concerns identified during QIA's 2013 Environmental Inspection.

Note, this technical memorandum is limited to the factors that need to be addressed to prevent degradation of the landscape and to establish physical stability long term. The return of biological productivity of the area is not in the scope of this technical memorandum as Baffinland is of the position that the key to returning arctic sites to productive landscapes must always be to first address any ongoing physical degradation from permafrost thaw or erosion by abnormal runoff conditions and then focus on strategies for return of biological productivity if required.

1.1 Objectives

The primary objectives in planning the reclamation and rehabilitation of Km97 Borrow Source is to establish pit drainage without initiating new degradation of the permafrost and to stabilize ice-rich permafrost soils that if thawed would result in ongoing and unstable depressions of pooled water.

[1] 2013 Mary River Project Environmental Inspection Report, Qikiqtani Inuit Association, 17 December, 2013

1.2 Interim Abandonment and Reclamation Plan Objectives

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 Km97 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[2] 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 Km97 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.

1.3 Requirements of the Landowner

Km97 Borrow Source is located on Inuit Owned Lands that are managed by the Inuit Association in the region, the QIA. As such, Km97 Borrow Source is subject to the guiding principles for reclamation of Inuit Owned Land developed by the QIA. The QIA reclamation principles applicable to Km97 Borrow Source, that the strategies presented within this technical memorandum address, 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.
- 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.

[2] 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)

- Land users may be required to undertake in post-activity monitoring to confirm reclamation objectives have been achieved.

1.4 Success Criteria of Km97 Borrow Source Progressive Reclamation and Rehabilitation

Based on the objectives and principles stated in section 1.2 and section 1.3, Baffinland proposes that the Km97 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).

2. Current Site Conditions

The borrow source area forming the basis of this technical memorandum is the portion of Km97 Borrow Source south of the Milne Inlet Tote Road and west of Camp Lake that has been accessed historically to provide material for the Milne Inlet Tote Road maintenance and material for construction of various lay down areas at the Mary River Mine Site. The area is approximately 8.21 ha with stockpile areas as well as areas of ponding and suspected permafrost degradation. Based on visual observations (see Photo 3-1) there is a large area of pooled water on the site. There is some evidence that shows that the water from Km97 Borrow Source discharged in an uncontrolled manner for a brief period during the 2013 freshet. The discharge pathway was overland to Camp Lake.

Ponded water within borrow pits insulates the local material which in turn retards winter freeze-back of the active layer. This results in retrogressive thickening of the active layer. Shallow ponding (less than 0.5m deep) that is short-lived following the freshet does occur at Km97 Borrow Source, although this is not deemed a present concern as it does not impact long term stability of the site. If ponding is observed as remaining persistent throughout the open water season and depressions deepen with time, then specific strategies to address reclamation and rehabilitation of these depressions will be developed as these conditions are counter-productive to concerted reclamation efforts.

Photo 3-1: Km97 Borrow Source: Typical depression formation from thaw of massive ice

3. Methodology

A drainage and rehabilitation plan for Km97 Borrow Source has been developed and is presented in drawing H349000-4138-10-015-0007. The conceptual approach for the drainage and rehabilitation plan is to divert water away from the site at the top and bottom of the existing slope so that accumulated surface water does not remain stagnant and allowed to pool or pond. In this effort, the following main steps will be taken:

- Develop the drainage such that standing water is limited to avoid thawing action within the pit.
- Grade Km97 Borrow Source area such that surface water runoff does not increase the risk of erosion and sedimentation over the undisturbed tundra.
- Encourage natural re-vegetation to enhance site aesthetics.

3.1 Drainage Improvements and Erosion Prevention

In order to prevent ongoing permafrost degradation, erosion, and improve the drainage at Km97 Borrow Source, the following steps will be taken:

- Assess the condition of the Milne Inlet Tote Road and borrow area at Km97 Borrow Source during/after freshet and collect additional survey data as required.
- Based on additional data and assessment, make appropriate changes to the drainage design as required and grade the slopes of the toes to ensure long term stability.
- Create diversion swales at the top and bottom of the site to divert surface water flow from the borrow site, and/or capture overland runoff from Km97 Borrow Source and discharge

to a nearby lake or water body in a controlled manner such that the quality of the discharge can be monitored and that the area remains well-drained. These diversion swales will be sized to have enough flow capacity and constructed in a manner that does not further degrade permafrost ground.

- Where there is evidence of ponding, remove the degraded material from within the depression, replace with suitable ice free native fill and/or run of quarry (if required) material and re-grade.
- Route any trapped surface water away from the pit to a nearby water body or diversion swale.
- Place swales to divert surface water away from areas that may be susceptible to permafrost degradation.
- Determine the nature of soils and ground ice that will remain exposed following excavation if new swales are needed – to ensure suitability of the newly exposed material.
- Swales will be lined with rip rap and rip rap lined aprons will be constructed for energy dissipation to encourage sediment deposition and limit erosion.
- Use only suitable ice free native material and/or run of quarry (if required) for fill and grade Km97 Borrow Source so that the site drains free, as appropriate.
- Additional rip rap shall be placed in locations that require additional flow velocity reduction to prevent soil erosion and downstream sediment deposition. Rip rap will also be placed at discharge locations so that the overland drainage can enter into Camp Lake in a controlled and stable manner.

3.2 Surface Grading

Once the activities outlined in section 3.1 are conducted the rehabilitation efforts of Km97 Borrow Source will focus on surface grading and removal of any obvious ridges/highpoints that impede surface drainage to develop the final surface contour that ensures drainage as designed. The final grading may be different to that shown in drawing H349000-4138-10-015-0007, but will not alter the intent of the designed drainage paths. At the end of surface grading, the surface will be scarified with tractor grouser bar ruts or similar to encourage natural re-vegetation by trapping of fines, pollen and seeds while also dissipating energy from runoff.

4. Timeframe for Rehabilitation

Terrain stability can seldom be achieved on disturbed permafrost terrain in a single summer season. Two or more staged seasons are expected to be required to complete reclamation of those pits where thaw of ground is most prevalent, such as Km97 Borrow Source. This schedule requires that site observations and monitoring of terrain response to reclamation efforts be also considered in reclamation planning. Monitoring will comprise a systematic set of observations of the Km97 Borrow Source area twice per year (anticipated to occur in early

summer and later summer) with limited surveying, as required, to confirm where grading required to prevent pond formation. It is intended that the site observations and monitoring data will provide a basis for optimizing reclamation efforts moving forward.

An initial survey was completed in March 2014 to establish low points and areas of focus for the reclamation and rehabilitation plan of Km97 Borrow Source. Based on this initial survey and historic information, it is expected that the initial work to re-grade the site will occur in the early summer of 2014. Once completed, the site will be observed throughout the remaining summer season to assess the effectiveness of the initial work and decide what further work is required in subsequent years to advance the rehabilitation of the area and reach the reclamation objectives.

Monitoring of the site should continue for a full summer season after the water quality results confirm conformance with the Mary River Type A Water Licence (2AM-MRY1325) requirements.

5. Closure

We trust this technical memo meets your present requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

Prepared by:

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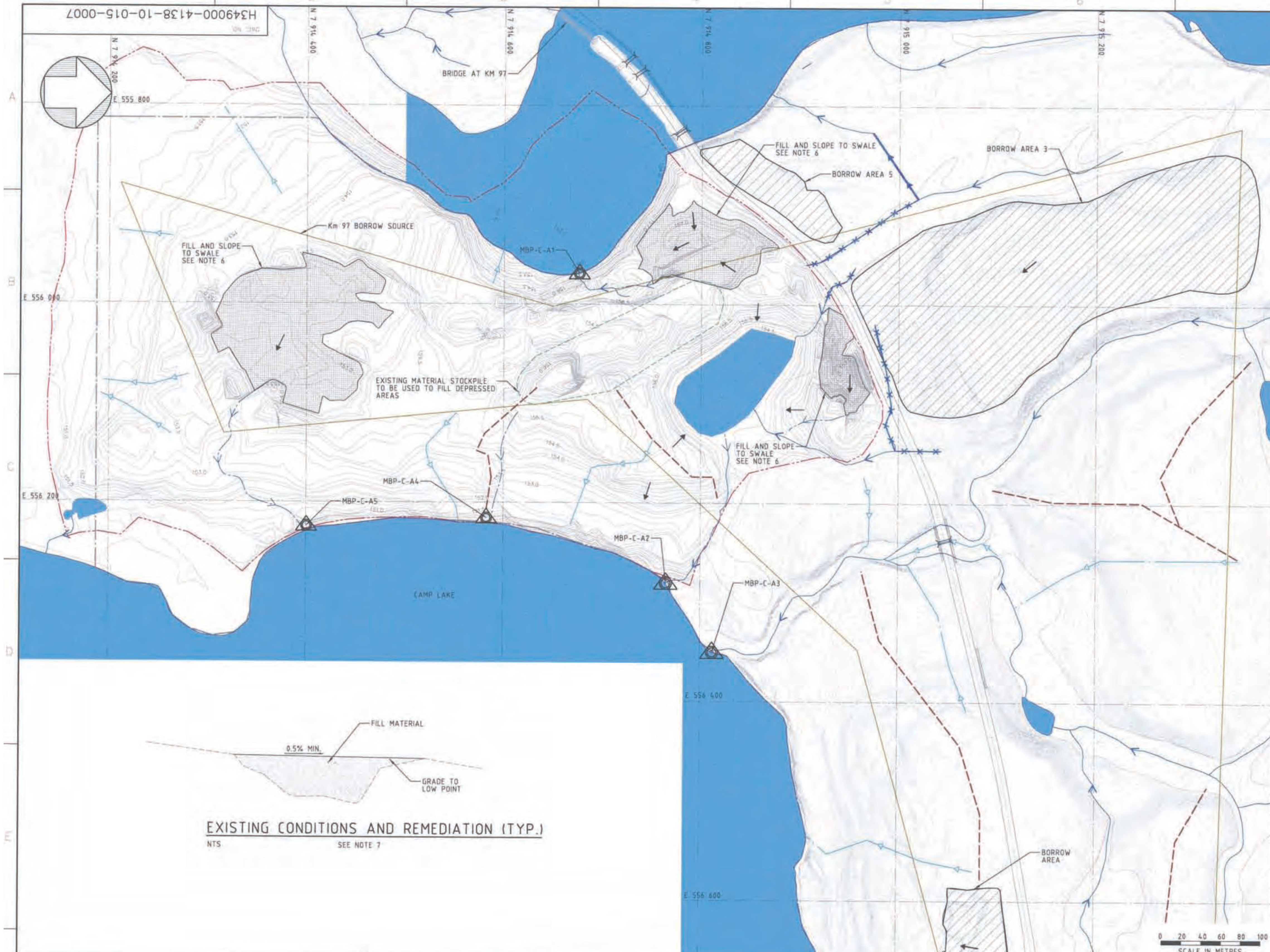
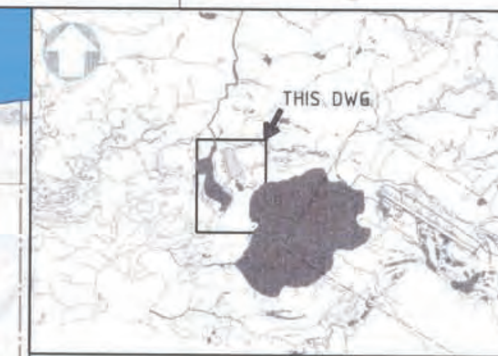
Joel Gregorios

TM:tm
Attachment(s)/Enclosure :
Drawing: H349000-4138-10-015-0007





KEY PLAN

LEGEND

- FILL AND GRADE DEPRESSIONS
- EXISTING WATERBODY
- PROPOSED FOOTPRINT OF BORROW AREA #3 and #2
- MARCH 2014 SURVEY LIMIT
- BOUNDARY
- EXISTING MATERIAL STOCKPILE
- EXISTING BOUNDARIES FOR BORROW AREAS AND ROCK QUARRY LOCATIONS
- CENTERLINE OF SWALE
- EXISTING STREAM
- OVERLAND FLOW PATH
- EXISTING DRAINAGE TO BE DIVERTED/ABANDONED
- SURFACE DRAINAGE DIVERSION
- INTERNAL SURFACE DRAINAGE
- RIDGE LINE (HIGH POINT)
- EXISTING CULVERT (LOCATION APPROXIMATE)
- PROPOSED ROAD/UTILITY BERM
- EXISTING ROAD
- PROPOSED WATER QUALITY MONITORING LOCATION

NOTES:

1. TOPOGRAPHY PROVIDED BY TERRAPOINT CANADA INC.
2. COORDINATE GRID IS SHOWN IN UTM (NAD83)E 17 AND IS IN METRES.
3. CONTOURS ARE IN METRES. CONTOUR INTERVAL IS METRE.
4. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES UNLESS NOTED OTHERWISE.
5. ALL LOW AREAS OR DEPRESSIONS SHALL BE FILLED AND GRADED TO DRAIN AREAS TO DISCHARGE LOCATIONS.
6. FINAL FILL EXTENTS, ELEVATIONS AND SURFACE SLOPES SHALL BE ADJUSTED IN THE FIELD.
7. REMOVE TOP LAYER OF SOIL INSIDE THE DEPRESSED AREA, FILL AND GRADE WITH ICE FREE SUITABLE NATIVE MATERIAL AND/OR RUN OF QUARRY (IF REQUIRED) TO ENSURE DRAINAGE MOVES SURFACE WATER TO NEAREST WATER BODY OR SWALE.

FOR PERMITTING

DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

PERMIT TO PRACTICE
HATCH LTD.
Signature
Date 27 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
LICENSEE
NT/NU

REV.	ISSUE FOR	AUTH.	BY	DATE
A	PERMITTING	SH	GJ	2014-03-27

ISSUE AUTHORIZATION

HATCH

DESIGNED BY: R. JUBINVILLE DATE 2014-03-27	DRAWN BY: G. JUBINVILLE DATE 2014-03-27
CHECKED BY: A. MOHEBKHANI DATE 2014-03-27	DISCIP. ENGR: S. HASSAN DATE 2014-03-27
PROJ. DES. COORD: T. THIERTELL DATE 2014-03-27	PROJ. ENGR: CLELAND DATE 2014-03-27
PROJ. MGR: S. PERRY DATE 2014-03-27	

Baffinland

MARY RIVER PROJECT

MINE SITE
KILOMETER 97 BORROW SOURCE AREA
DRAINAGE AND REHABILITATION PLAN

SCALE	DWG. NO.	REV.
1:2000 OR AS NOTED	H349000-4138-10-015-0007	A

ORIGINAL SHEET SIZE: ISO A1 (841 x 594)

Appendix C –
Concordance with Commercial Lease Number: Q13C301 – Schedule "B" Quarry Concession Agreement

Concordance with Commercial Lease No. Q13C301 – Schedule "B" Quarry Concession Agreement

Reference	Condition	Section
Schedule B, Item #1	The landlord hereby authorizes the Tenant to quarry and take Specified Substances only from Land Use Areas within the Property designated as Impact Areas, and for the permitted purposes set forth in Section 2.5 in the Lease to which this Agreement is annexed as a schedule (the "Lease"). All quarrying activity shall be further exclusively limited to lands to be identified as a "Borrow Source", "Rock Quarry", "Quarry Site" or the Milne Inlet Tote Road in a "Quarry Management Plan" that shall be submitted by the Tenant to the Landlord, or Lands within the Property otherwise agreed to by the Landlord and Tenant, subject to the terms and conditions set forth in this Agreement. Each individual quarry site requires a Quarry Management Plan.	Section 2.0, Table 2-1
Schedule B, Item #4	On termination of the Lease, howsoever occurring, or upon closure of a quarry site from time to time during the Term, the Tenant shall restore the Lands in compliance with the closure and reclamation provisions of the Quarry Management Plan and the Lease.	Section 4.0
Schedule B, Item #7	All quarrying under this Agreement shall be carried out in accordance with the terms of the Mine Health & Safety Act (Nunavut), as the provisions thereof may apply.	Section 1.1
Schedule B, Item # 11	The Tenant represents and warrants that it is and shall remain in compliance with all federal, territorial and municipal statutes, regulations, bylaws, codes or policies and with the orders and requirements of any competent regulatory authorities, in respect of its entry and actions on the Lands.	Section 1.1
Schedule B, Item #12	"Carving stone" means uthugighak and sananguagaq, which means serpentines, argillite and soapstone as defined pursuant to Article 1.1.1 of the Nunavut Land Claims Agreement, and the Tenant shall in all respects comply with the provisions of Article 19 of the IIBA with respect to the rights of Inuit to Carving Stone.	Section 3.1
Schedule B, Item #15	The Tenant shall observe, perform and abide by all Quarry Management Plans and the terms and conditions of the Lease, including the Environmental Terms and Conditions attached as Schedule "F" to the Lease, and including all environmental	Section 3.0

Reference	Condition	Section
	monitoring and inspection requirements respecting quarries and quarrying activity, whether pursuant to the Lease or a Quarry Management Plan, and the Tenant shall observe, perform and abide by any Best Practices or standards established from time to time.	
Schedule B, Item #18	The Tenant Further agrees:	
	a) Not to undertake any quarrying activities on the Property until the Tenant has obtained the Landlords' express written consent to a Quarry Management Plan, which consent shall not be unreasonably withheld; and	Awaiting QIA approval
	b) the Tenant shall not undertake or permit to occur any material changes in the Operations or the Work with respect to the Property under an approved Quarry Management Plan, until the Tenant has submitted in writing to the Landlord a proposed amended Quarry Management Plan and obtained the express written consent of the Landlord, which consent shall not be unreasonably withheld.	Section 1.2
Schedule B, Item #19	The Tenant shall deliver to the Landlord for its consent with its annual Work Plan by not later than November 1st in each Year during the Term of the Lease a proposed Quarry Management Plan for the succeeding Year which shall include:	
	a) a plan of property, including a physical description of the quarry areas the Tenant plans on accessing including detailed mapping coordinates and locations within the quarry areas to the satisfaction of the Landlord;	Section 2.0 Table 2-1 Appendix A
	b) anticipated volumes of materials in aggregate, and broken down for each quarry site, that the Tenant proposes to quarry in that Year;	Table 2-1. Annual estimate of material to be extracted to be provided in the work plan for the following year
	c) the details as to the construction and development of structures;	Section 2.1
	d) specific details for the proposed rehabilitation of the area for the Year covered by the Quarry Management Plan (and subsequent Years as appropriate);	Section 4.0
	e) specific plans to stock pile overburden and soil to be stored for	Table 2-1

Reference	Condition	Section
	rehabilitation;	
	f) specific plans for the use of overburden and soil in rehabilitation;	Table 2-1 and Appendix B
	g) plans for grading of the area back to its natural contours including reestablishment, to the extent possible, of flora disturbed by the Tenant's activities or presence on the Property; and	Section 4.0 and Appendix B
	h) proposed abandonment and reclamation plans that are specific to each quarry location.	Section 4.0 and Appendix B
Schedule B, Item #22	The Tenant acknowledges and agrees that any consent to a new Quarry Management Plan, or to an amended Quarry Management Plan may be subject to:	
	a) such increase in the Security Deposit to be held by the Landlord pursuant to the Lease; and/or,	Subject to annual work plan and securities review. See Section 1.1 and 4.2
	b) such further terms and conditions to address matters relating to, or that are in addition to or in substitution for, terms and conditions addressing the matters set out in Section 19 of this Agreement,	Not Applicable
	As shall be required by the Landlord, in its reasonable discretion, to address concerns reasonably arising out of Operations in respect of the new or amended Quarry Management Plan.	
Schedule B, Item #23	Once approved by the Landlord all quarry site locations are subject to survey by a Canada Land Surveyor at the Tenant's sole cost and expense.	Section 2.1.1
Schedule B, Item #29	A monthly report during Construction and a quarterly report during Operations shall be submitted by the Tenant to the Landlord indicating the quantity of materials quarried and the quantity of material removed from each quarry site relative to the total quantity of materials available at each quarry site.	Section 2.1.9